

Our Biggest Government Mine, see p.p. 1037-1041

JUL 2 1923

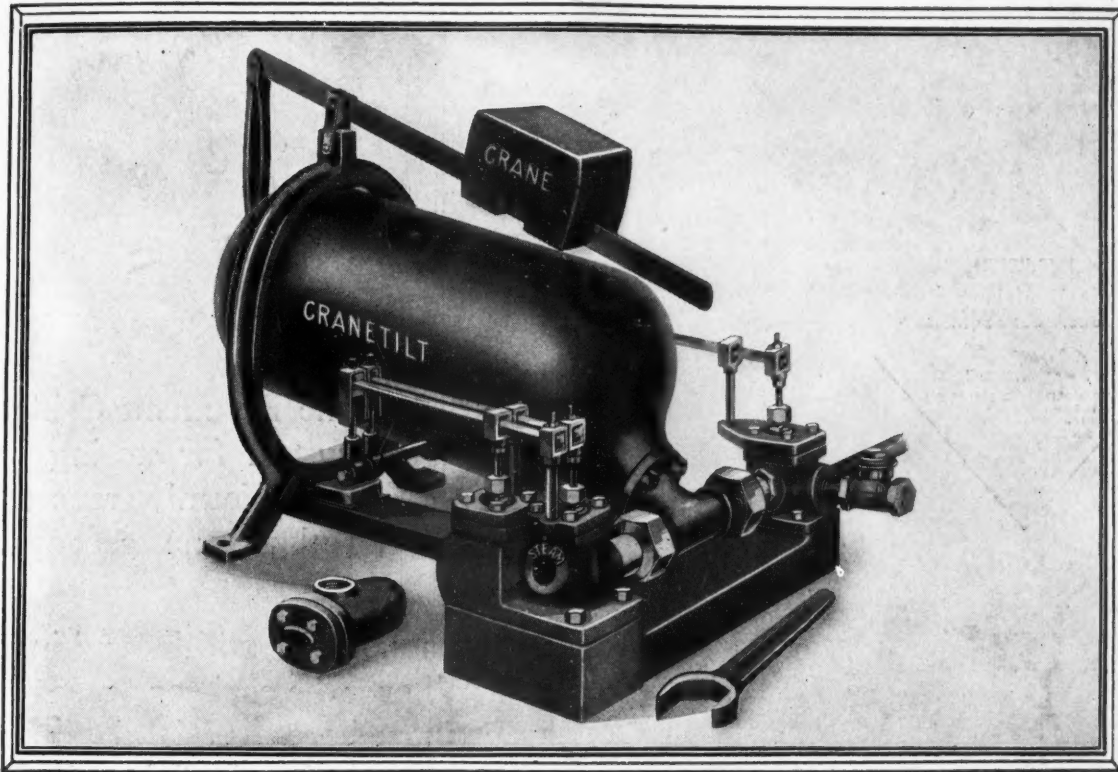
COAL AGE

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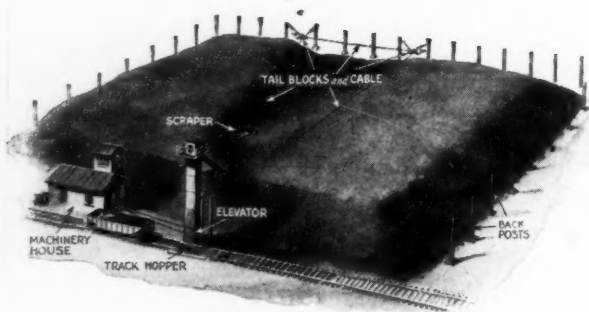
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COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, Editor

Volume 23

NEW YORK, JUNE 28, 1923

Number 26

Lewis Fights the Reds

BORING from within, the radicals are attacking the United Mine Workers. Led by the well-known William Z. Foster and the indefatigable Alex. Howat a movement styling itself the Progressive International Committee of the miners' union has sprung up in the Pittsburgh district. As pointed out in a statement given out by the International Executive Board of the United Mine Workers at Indianapolis last week, this movement is part and parcel of a kind that has infested the Southwest and several parts of Canada. The union authorities "view with great concern" the spread of radicalism in the ranks of the mine workers. The executive committee gave a week or more to a study of how to check it. They are setting out to discard from their organization those who participate in such "dual" associations.

The American labor movement is sincere in its condemnation of radicalism and consistently repulses its spread, even if at times making much ado of the process. It is not a straw man that is being knocked down. The menace to the United Mine Workers has become so real that John L. Lewis can no longer temporize. The outlawry within his organization has assumed such proportions in the last few years as to threaten conservative leadership. So sinister has the cloud become that, it is reported, Farrington has joined hands with Lewis, abandoning his support of the reds, assumed in the past for political purposes, in the effort to save the union from the assault of communism.

It is going to be a stiff job to mop up the scuff, especially after playing with it for so long, but it is giving the Lewis régime a valuable lesson. Perhaps, and we so hope, a chastened United Mine Workers will result—one less inclined to take the country by the throat, one more inclined to reason than war.

Can Bituminous Coal Use an Overlord?

JOHAN C. BRYDON, last week elected president of the National Coal Association, set both feet in a forward direction in his characteristic aggressive way. He told the soft-coal operators that their industry needs a leader and executive who is influenced neither by his own business interests nor sectional considerations, and that on top of the individual operator's interest in mining and distributing coal efficiently there is a responsibility resting on the industry as a whole to look after the fuel requirements of the country.

He advocates a full-time executive as the head of the National, one to whom the public may look with respect as well as one who can command the producer, large or small. The idea is not new, for, encouraged by the success of Judge Landis, Will Hays and Franklin Roosevelt with baseball, moving pictures and construction respectively, these coal men have been considering its possibilities in the coal industry. To Mr. Brydon has

been given the task of putting the idea to work. As a means of consolidating a wide variety of interests and harmonizing a medley of opinion no happier solution has been voiced.

But it is because Mr. Brydon coupled with his recommendation for the new kind of leadership the suggestion for the organization within the soft-coal industry of the kind of machinery for public service that the anthracite operators have developed so well and time and again demonstrated its effectiveness that he may be credited with being in the way of removing the operators' "blind spot." Experience has demonstrated that the public is less inclined to be suspicious, is in fact, more tolerant and less exacting of any group of business men who give evidence of taking the people into their confidence. The way to the heart of the public lies in telling your good points rather than stressing the bad points of your associates.

The idea, for instance, has been fostered and allowed to grow that the soft-coal industry is inefficient and wasteful. In certain respects this is true, but not more so than of other industries. As between apologizing for its shortcomings and expounding the simple facts with respect to the big things the coal industry does accomplish, there is no argument as to which is better publicity. Restriction of output by the unions is an example of internal maladjustment the recital of which serves but to cast doubt on the ability of its management, whereas a widespread understanding of the development of mining machines, fast underground transportation, safety practices and equipment for cleaning and preparing coal for market will give the public a new confidence in the industry.

There is nothing novel in Mr. Brydon's suggestion of machinery for emergency distribution of soft coal. As regards the needs of the government in war time, the plan was successfully worked out in 1917 prior to the Fuel Administration. Considerably more than half the machinery and expense of the distribution machinery of the Fuel Administration was supplied voluntarily by the coal operators. In 1920 arbitrary distribution was urged by the operators' organization and made effective through the power of government. The operators went even further then and set up "fair-price" committees the effectiveness of which none may doubt.

Nor is it pertinent at this time to inquire as to how far anyone may commit the soft-coal industry to any particular line of performance. It is quite certain that it has no such large element as the feudalistically controlled Hudson Coal Co. in the anthracite industry to confound its combined effort in the public interest, or in its own interest, for that matter.

The program on which Mr. Brydon starts off is not a spontaneous extemporaneous outburst. It follows logically the thinking, planning and desires of the retiring president of the National Coal Association, Alfred Ogle, who surrenders the reins after the most turbulent year in the history of that organization.

Does It Pay to Restrict Expenditure?

NO ONE can deny that Frank Haas, in his paper before the West Virginia Mining Institute, printed this week, has chosen an admirable subject for consideration, nor can it be gainsaid that he has applied most valuable principles in reaching his conclusions on the value of economy in laying out a mine. Subtle methods of reasoning, however, need careful investigation or errors will creep in, not only mathematical errors but those having to do with assumptions. Consequently we are justified in questioning whether all Mr. Haas' premises are correct.

Is he, for instance, justified in assuming that the gross earnings per ton of expensively and inexpensively equipped mines are equal? We are not by any means convinced that this is true. Men do not spend \$2 instead of 50c. per ton of annual production for building their plant, much less \$8 and even more, as some are doing, without the hope that the gross earning per ton of coal mined will be increased and that the net earnings will be greater in consequence, though it is recognized that they will be reduced somewhat by the higher fixed charges.

Mr. Haas is right in holding that if the gross earnings per ton are not increased by greater expenditures they will justify the conclusions he has reached, but granted that better equipment and outlay does more than raise tonnage, then his results must be accepted with appropriate reserve.

Here it should be stated that large tonnages themselves have a way of reducing labor bills and so with any given price for coal they increase gross earnings. Expenditures on certain classes of machinery improve quality and raise the selling price, thus also increasing gross earnings. These facts cannot be waived aside as matters of no commercial importance. In fact we are afraid that in making his calculations Mr. Haas has quietly and unintentionally assumed that which he wishes to prove, and that done, all that follows is quite to be expected.

Nor are we clear that obsolescence is to be satisfactorily disposed of as Mr. Haas has indicated. There is obsolescence of two kinds in a mine—one due to machinery becoming antiquated and another due to inherent mine obsolescence. The mine in time becomes difficult to ventilate; airways that are adequate in a young mine are less equal or even unequal to the work of ventilating an old one. The fan becomes inefficient from the same cause, the equivalent orifice of the mine changing. Larger locomotives become necessary. New airshafts must be sunk or new openings made. These are progressive changes, growing with the progress of the mine.

We may not perhaps scrap or sell the machinery, but if we do not, we face a steady and far heavier loss. The burden of using obsolete machinery or running with obsolete conditions is even heavier than that borne by the man who brings his mine up to date. If we scrap the equipment and buy new, if we make further development to supplement that which is inadequate, we add to the fixed charges. Consequently we decrease the net earnings. This obsolescence is likely to be less if the first equipment is fully abreast of the times when installed and its purchase not too closely based on the principle of keeping down equipment costs. It will be distinctly less if the early development is conceived on a sufficiently liberal basis.

If we assume that the mine is allowed to remain obsolete the fixed charges will remain the same but the cost of labor will increase. If the excess of selling price over payroll and material costs is 50c. when the mine is opened, can we assume that it will still be 50c. when the mine has been working 20 or even 40 years? The operating cost may be so high by that time that there may be no net earnings. Of course, other competitive mines are being subjected to a similar increase in operating costs, and in consequence the price of coal may be kept at a level giving the same excess over payroll and material costs, but that is an assumption not very safe in the United States with new mines always opening, some of which are in new territory.

Mr. Haas has led the way to a new kind of thinking. His mistakes are not easily corrected but we are convinced that some of them will make a revision necessary, and we prophesy that the author of the paper will be one of the first to venture on their correction, as his logical precision and long experience will fit him to do.

Eliot's Eight Points

CHARLES W. ELIOT, president emeritus of Harvard University, set forth for the coal operators assembled at Atlantic City last week the eight points which he considers represent what the public has a right to expect the United States Coal Commission to cover in its recommendations.

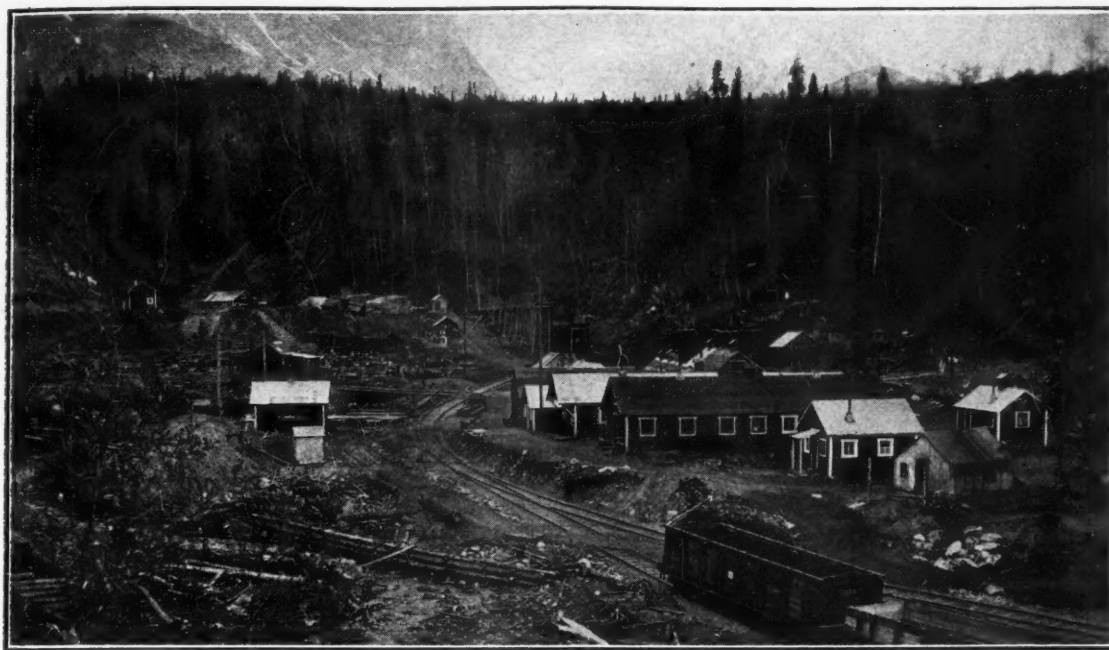
Those points dealing with the necessity of provision for keeping order in the coal fields and for protection of the public against monopoly either among employers or employees will be readily accepted, as should the proposal for incorporation of the union. Two of Dr. Eliot's points deal with development of a partnership relation between management and labor, one aspect of which, of course, would be the elimination of restriction of output. Partnership involves the idea of participation in profits. Just how much further Dr. Eliot would have the industry go than at present in this regard is not stated but the fact remains that through the exercise of its "economic strength" the miners' union has exacted its share of the profits from an industry that until the war had no profits. The union has gone further and assumed a large share of management. In the union fields the mine workers are partners just so far as they are willing to take on that relationship.

The remaining three of the eight points have to do with arbitration of industrial disputes. Here most assuredly lies the greatest public interest, for the public suffers most from lack of coal when the mines stop. Dr. Eliot points out the "high value toward prevention and settlement of industrial disputes of face-to-face discussion between parties before an impartial tribunal whose decision is effectively published." This is a fair statement of the problem that has been facing the coal industry, but who is to induce the United Mine Workers to accept any form of arbitration?

EVEN WHEN DEBTS ARE CANCELLED, somebody has to pay them.—*Philadelphia Evening Public Ledger*.

SMOOTH WORK. We won't have a new coal strike until after the old one has stopped hurting.—*Financial America*.

THE FRENCH PLAN in the Ruhr would work if the Germans would.—*Tacoma Ledger*.



Biggest of Our National Government's Coal Mines— Its History, Coal Seams and Operation

Mine Opened by Gold-Mine Owner—Coal First Shipped by Sled—
Faults Drove Out Private Capital—Coal Good but Thin—Labor \$4.50
per Day and Up—Mine Cost \$6.50 per Ton—Operation Profitable

BY SUMNER S. SMITH
Eska, Alaska

SO MUCH has been written in a general way regarding Alaskan coal fields that a description of the Eska mine, though it be small as compared to Eastern standards, may be warranted at this time because to date, it is the largest producer of coal in Alaska and is characteristic of this field.

The mine is approximately 60 miles from Anchorage, at the terminus of a three-mile standard-gage spur from the Chickaloon branch of the government railroad. The mine openings are on Eska Creek, a rather short, turbulent stream which rises in the Talkeetna Mountains to the north, follows the valley on the eastern flank of Wishbone Hill and flows into the Matanuska River near Mile A-18 on the railroad branch.

The natives who lived in the Matanuska Valley for many years knew of the existence of coal and mention is made of these beds in 1898 by W. C. Mendenhall, who accompanied Captain Edwin F. Glenn as geologist on the military expedition from Prince William Sound toward the Tanana by way of the Matanuska River.

NOTE—Headpiece shows the Eska coal mines. The building with the dog is the mess house, that on the near side of it is the store; the house next to it toward the foreground with the projecting roof is the office; the long building still further in the foreground is a bunk house and the small building with white roof is the hospital. The power house is seen over the dump on the left and the two trestles to the right are for Martin East, Shaw East and Eska East Mines and for the Maitland Mine, respectively. The small stream in the foreground is the turbulent Eska, kept in place by sundry cribbings. (Cut captions added by editorial department.)

The earliest recorded locations were made about 1903 and much prospecting was undertaken on Moose, Eska, Coal and O'Brien creeks, Chickaloon River and Kings River. Reconnaissance parties from the U. S. Geological Survey made investigations in 1905, 1906 and 1909, and in 1910 a detailed study of the valley was made by Dr. G. C. Martin.

In 1906 all the coal lands in Alaska were withdrawn from entry by an executive order of the President and were not restored until 1916, following a subdivisional survey by the U. S. Land Office in 1915, when the areas believed to contain coal of commercial importance were laid out in leasing units.

In 1912 President Taft sent a commission to Alaska to report on the feasibility of constructing a railroad from the coast to the interior of the territory and in 1914 Congress passed an act authorizing this project. In the spring of 1915 the President selected what is commonly known as the Broad Pass route, which has its ocean terminus at Seward, follows round the head of Turnagain and Knik arms, crosses the Matanuska to the Susitna drainage, goes through Broad Pass, down the Nenana and up the Tanana drainage to Fairbanks.

It was stipulated that a branch should be constructed up the Matanuska Valley to open the coal fields. The route selected for the main line was approximately 470 miles long and the branch route 40 miles. The town of

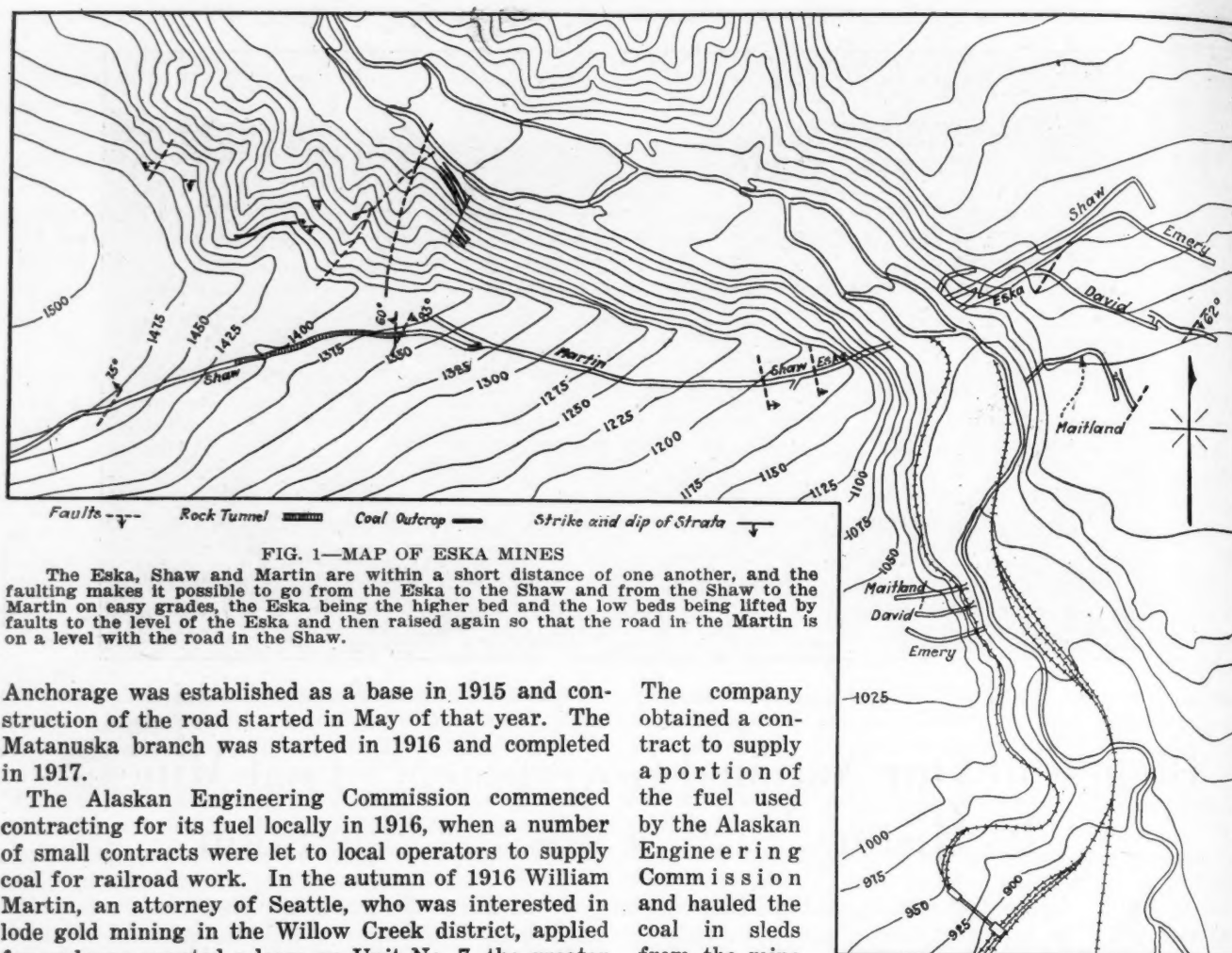


FIG. 1—MAP OF ESKA MINES

The Eska, Shaw and Martin are within a short distance of one another, and the faulting makes it possible to go from the Eska to the Shaw and from the Shaw to the Martin on easy grades, the Eska being the higher bed and the low beds being lifted by faults to the level of the Eska and then raised again so that the road in the Martin is on a level with the road in the Shaw.

Anchorage was established as a base in 1915 and construction of the road started in May of that year. The Matanuska branch was started in 1916 and completed in 1917.

The Alaskan Engineering Commission commenced contracting for its fuel locally in 1916, when a number of small contracts were let to local operators to supply coal for railroad work. In the autumn of 1916 William Martin, an attorney of Seattle, who was interested in lode gold mining in the Willow Creek district, applied for and was granted a lease on Unit No. 7, the greater portion of which lay on the western side of Eska Creek on the eastern flank of Wishbone Hill. This lease was later assigned to the Eska Creek Coal Co., which corporation commenced work in January, 1917, erecting log buildings for use as dining room and bunkhouse with several tents for living quarters and warehouses.

Five entries were started, three on the west and two on the east side of the creek, and open cuts were made which exposed several other beds, although all of these seams were thin, the biggest being less than 5 ft. thick.

The company obtained a contract to supply a portion of the fuel used by the Alaskan Engineering Commission and hauled the coal in sleds from the mine to the railroad, a distance of approximately three miles. With the advent of spring the coal could not be hauled with any satisfaction in sleds or wagons, so a standard-gauge spur was constructed on the property and another contract let based on the delivery of coal in railroad cars at the mine.

Soon after the completion of the spur the coal in the entries driven by the lessees was cut off by a somewhat complicated series of faults, and as the company did not care to assume the expense of opening other beds,

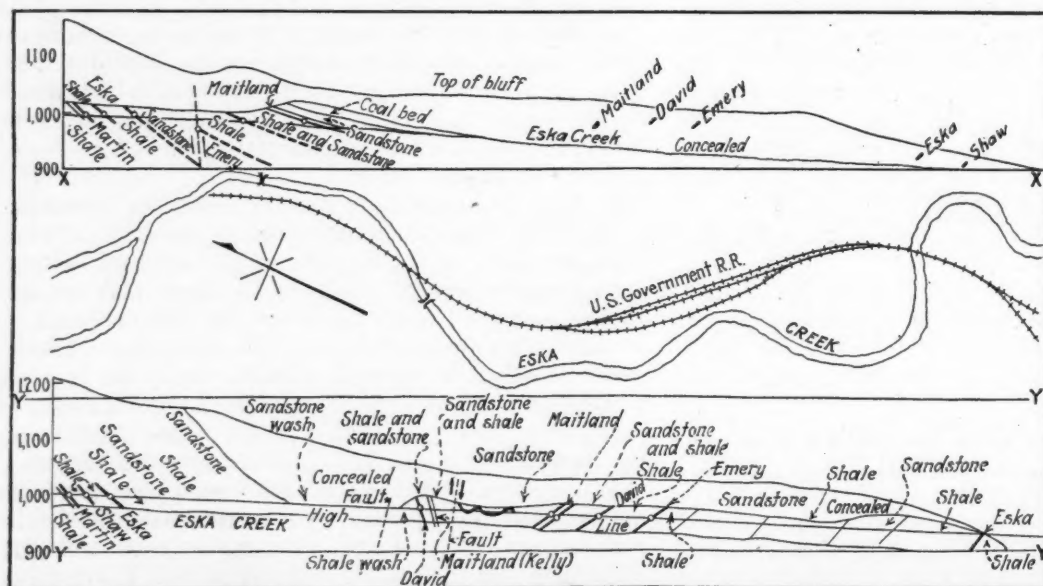


FIG. 2

Geological Map, Eska Field

Plan and two cross-sectional elevations taken at XX and YY. A steep-sided syncline runs across the Eska River. The measures also are faulted and in eastern section are cut by igneous dykes.

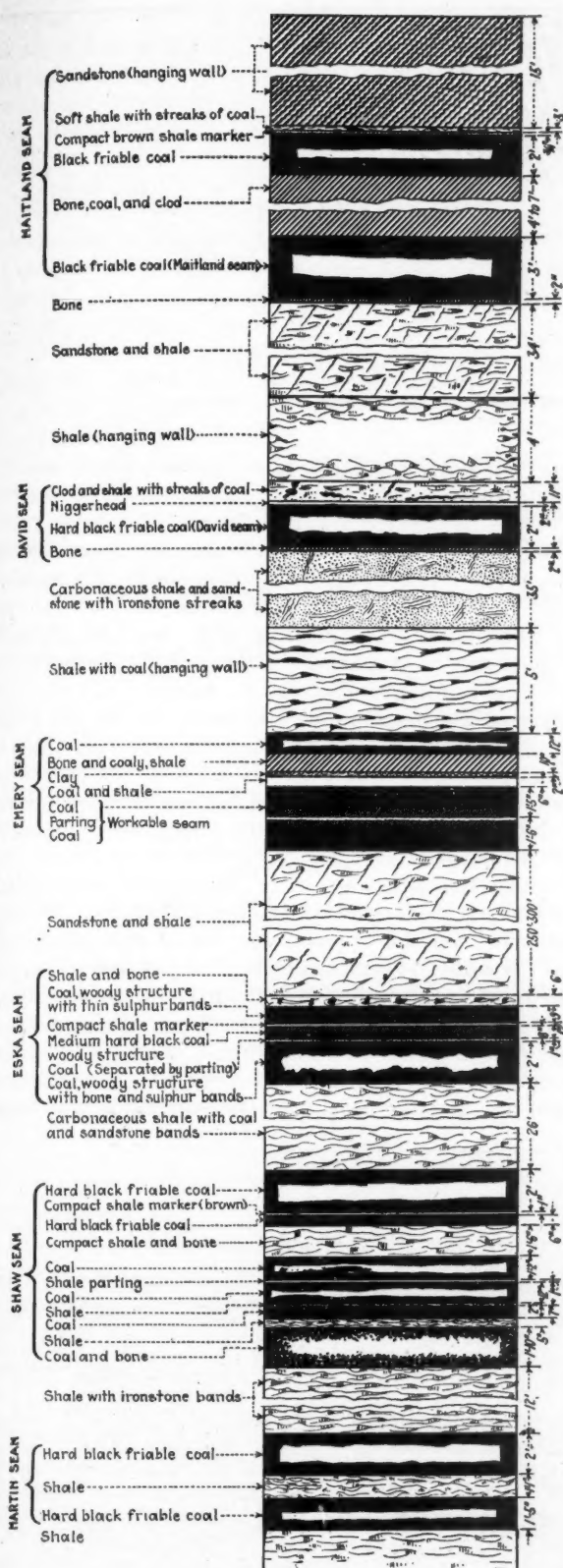


FIG. 3—CROSS-SECTION OF COAL MEASURES

The Eska measures are in two divisions, the upper and the lower. The upper consist of the Maitland, David and Emery, and the lower of Eska, Shaw and Martin. The sandstones and shales between the two groups are 250 to 300 ft. thick. Breaks have been made in the section where the bigger intervals occur.

though their outcrops indicated an abundant supply of fuel, the property was sold to the Alaskan Engineering Commission in June, 1917.

Upon taking over the property, the commission enlarged the dining room, constructed an additional bunkhouse, a washhouse and change room, an office, store,

power house, first-aid hospital and six cottages for married employees. Water, sewer, light and telephone systems were installed and work started on a hand sorting plant where the coarser refuse was picked from the screened coal. This and a railroad yard were completed in 1918, since which time three cottages, a staff house and a 48-room dormitory which is modern in every respect have been added to the living quarters. In October of 1921 the mine was closed and all fuel for the railroad purchased from local operators, but in November, 1922, a fire in the adjoining property closed that mine and cut off the commission's chief supply of bituminous coal, which is used for all engine service, and the Eska property was immediately reopened.

The Matanuska Valley is a sunken fault block between two rugged mountain ranges, the Talkeetnas on the north and the Chugach on the south. Here the coal-bearing measures of the valley have been folded and bent and, in the eastern end of the district, invaded by igneous dikes. The coals are of the same geologic age as the Cook Inlet lignites, but, due to the processes mentioned, have advanced in grade till all types, ranging from lignite on the west to anthracite on the east, may be found throughout the valley. The medium-rank bituminous coals are excellent steam or domestic fuels and the higher-rank coals of this grade are first class for blacksmith use or the manufacture of metallurgical coke. On the recent tests made by the navy these coals were demonstrated the equal of the coals of navy standard of the Atlantic coast. The two analyses in Table I are typical of bituminous coals of different rank from different portions of the field:

TABLE I—TWO ANALYSES OF MATANUSKA COALS
MAITLAND BED, ESKA MINE

	Coal, Air Dried	Coal, As Received	Coal, Moisture- Free	Coal, Moisture- and-Ash-Free
Moisture	3.23	5.06	.....	.....
Volatile Matter	42.82	42.01	44.25	47.90
Fixed carbon	46.58	45.70	48.13	52.10
Ash	7.37	7.23	7.62	.....
	100.00	100.00	100.00	100.00

No. 3 BED, CHICKALOON MINE

	Coal, Air Dried	Coal, As Received	Coal, Moisture- Free	Coal, Moisture- and-Ash-Free
Moisture	0.5	1.4	.....	.....
Volatile	18.5	18.4	18.6	20.3
Fixed carbon	73.0	72.2	73.3	79.7
Ash	8.0	8.0	8.1	.....
	100.00	100.00	100.00	100.00

The above samples are selected because of the similarity of their ash content. It is probable that the average samples cut at Eska would run higher in ash and those at Chickaloon somewhat lower than the above.

The stratigraphic cross-section shown in Fig. 2 was worked out by Dr. George C. Martin and Theodore Chapin, of the U. S. Geological Survey, and the following quotation is taken from Bulletin 712-E of the Survey by Chapin: "The coal-bearing rocks at the Eska Mine occur in an open syncline whose axis strikes across Eska Creek near the center of the mine camp. The coal beds have been identified on both limbs of the syncline and on both sides of the creek, which crosses the coal tract and divides it into two parts. Stratigraphically the coal beds occur in two groups of three each, separated by a thick integral of sandstone and shale. Although the coal and the enclosing sediments vary in character and thickness from place to place, the coal beds have prominent markers which are persistent enough to identify the beds with little doubt wherever they have been opened."

In mapping the structural geology of the mine a crushed or faulted zone was noted about 1,500 or

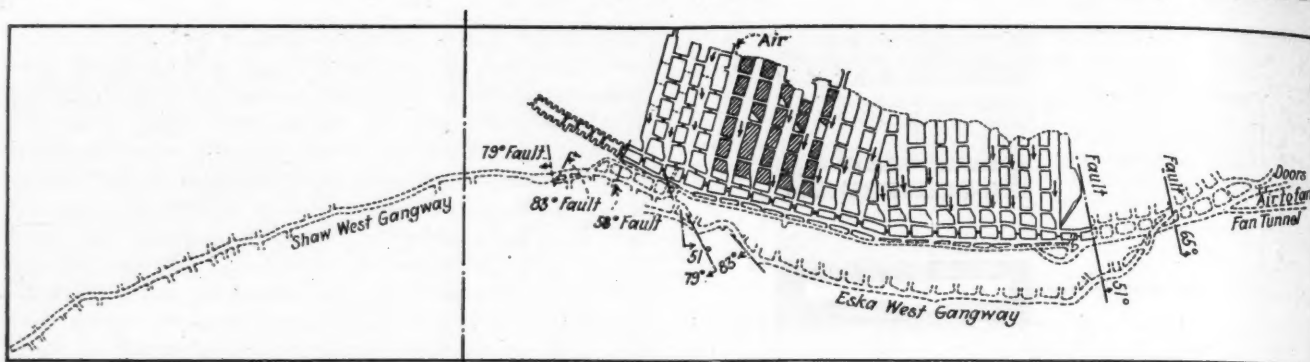


FIG. 4—PROGRESS PLAT OF MARTIN WEST MINE IN LOWEST SEAM OF SERIES

This also shows in broken lines the roadways driven in other beds of coal, the Shaw and the Eska, some of these roadways in other seams being part of the ventilation and transportation system of the Martin West workings though not in that bed.

1,600 ft. west of the portal of the Eska West gangway. This zone was several hundred feet in width and its position indicated that the coal on the northern limb of the syncline would be off when the gangway reached a point along the strike of this fault. Fragments of the known coal beds were uncovered on the surface in this area, and the seams traced to points where the structure appeared fairly regular (Fig. 2). From a series of observations on the dip and strike of the strata along the outcrops of the coal beds the probable position of the beds on the same level as the Shaw gangway was plotted on the map and this entry driven nearly 700 ft. through the rock to pick up these seams.

All haulageways, or gangways, are driven on the coal, the standard timber set being 6 ft. wide at the top, 9 ft. at the bottom and the collar $6\frac{1}{2}$ ft. above the rail. Forty-pound steel is used on the mine tracks, which have a gage of 36 in. and a grade of 0.6 per cent in favor of the loads. The airways, which are from 5 to 6 ft. wide and approximately 4 ft. high, are driven so as to leave a 30-ft. pillar between them and the haulageways. Chutes are 8 ft. wide, giving 4 ft. for the manway and 4 ft. for the coal chutes, which are lined with sheet iron. The coal is mined by the room-and-pillar system, the

rooms being driven 20 ft. wide and on 50-ft. centers. Crosscuts are driven between rooms every 50 ft. On the west side the pitch varies from 25 to 45 deg. In consequence, the coal runs readily in the chutes, but on the east side the Maitland and David seams dip approximately 10 or 12 deg. on the northern limb of the syncline where they have been opened. On the Maitland bed the practice has been to use a McGinty with two small cars running in balance to convey the coal from the face of the rooms to the gangway, but on the David roof conditions were such that a large quantity of material had to be gobbled and but little room left for tracks. Here a chute and manway were carried close to one rib, the chute being well lined with sheet iron. A water main from tanks just above the David workings was laid along the gangway with branches to each room. With water thus supplied the coal was flushed to the cars below. The volume of water per ton of coal moved was fairly constant regardless of the distance from the face of the room to the gangway. About 218 gallons of flushing water was used for each ton of coal thus conveyed.

The coal is sheared on one side of the room and shot with permissible powder, Monobel No. 5 or Miners' Friend No. 5, both proving satisfactory for this work.



FIG. 5—MINERS' DORMITORY, ESKA MINES, JULY 23, 1921

Alaska blooms in her short summer. This does not look like a land of snows. The Alaska Engineering Commission's operation is marked by all due frugality. Neither the nation nor the nation's people can afford to venture too far from economical business principles, and Eska shows no prodigal expenditure of the taxpayers' money.

When the rooms are driven rapidly and the pillars removed promptly no trouble is experienced with squeezing along the entries or caving in the rooms, but if the rooms are driven and the pillars allowed to stand a long time the recovery of the pillar coal becomes a difficult matter.

Fig. 3 gives stratigraphic cross sections which indicate the thickness of the beds and the mining conditions better than any description.

The coal is hauled about 2,500 ft. from the mine to the cleaning plant, where it passes over a $\frac{3}{4}$ -in. shaking screen, the lower end of which acts as a picking table where the coarser of the refuse is removed. As practically all the coal is used by the railroad the fine and the picked oversize is allowed to run into the same car and is shipped as run-of-mine, although it can be loaded separately as lump and steam coal. The coal as thus shipped will average about 20 per cent ash. With proper washing this probably could be reduced to 14 per cent. There are, however, several other properties in the Eska district the run-of-mine coal from which has an ash content which is only a trifle in excess of 10 per cent.

The mine is ventilated by two Jeffrey double-inlet stepped multi-bladed reversible fans belted to steam

engines. As there is practically no gas in the mine, the main haulageways are made the returns, thus preventing the water in the ditch from freezing and overflowing the track in winter time. The details are shown on the mine maps.

Because of the physical condition of the seams and the lack (in the past) of proper washing equipment it was considered better to pay day wages rather than contract the mining of the coal. Skilled underground laborers such as miners or timbermen are paid \$8.60 per 8-hour shift, unskilled underground labor \$7.80, skilled surface labor \$6.60, semi-skilled surface labor \$5.20 and unskilled surface labor \$4.50. Board costs \$1.50 per day and rooms 25c. per day.

Over a period of six years, one of which the mine was idle, the production of coal has amounted to some 200,000 net tons, the average cost of which has been \$6.50 per ton divided as follows: Investment, \$1.20; maintenance and operation, \$5.30. As compared with the coal imported from the States the Eska mine has saved the commission approximately a million and a half dollars and had the mine been operated continuously the total investment could be written off when the cost is compared with the price paid to private operators in the field.

Removing Coal from Under the Susquehanna River Where Cover Is Shallow

BY DEVER C. ASHMEAD*
Kingston, Pa.

IN MANY PARTS of the anthracite region and particularly in the Northern or Wyoming Field, much of the mining is under the Susquehanna River and what is known as the "Buried Valley." This latter is a prehistoric river valley that was filled with drift during the glacial period. As there is no drainage from the valley and as the Susquehanna River flows over the surface the glacial material is saturated with water and contains large areas of quicksand.

In consequence when any of the mine workings

*Now of U. S. Coal Commission.

approach this valley or the river itself, great care has to be taken so that neither the sand nor gravel from the valley flows into the mines and that water from the river shall not come down through cracks that may extend from the mine to the surface. When the beds being mined are not near the surface the operations known as first mining are conducted in practically the same manner as usual and the percentage of coal extracted in that part of the work is as large as it would be if the river and the Buried Valley did not exist. Even second mining is now being undertaken in parts of the region where the beds are well covered by pre-glacial strata.

At one colliery the Red Ash bed, which is about 15 ft. thick, is being completely extracted directly under the Susquehanna River. The depth below the surface, however, is about 1,200 ft. Although this coal is being com-

FIG. 1

Mining Under Susquehanna

At the Cortright Slope of No. 14 Colliery of the Pennsylvania Coal Co., between Wilkes-Barre and Scranton, coal is extracted by pairs of headings 135 ft. apart. This is the first mining. After the coal is extracted the headings are rock-filled. Then the pillar is split by another pair of headings, which also are piled full of rock for fear that they might collapse after having been worked and might let in such a quantity of surface water as would close the mine. No pillars are drawn.

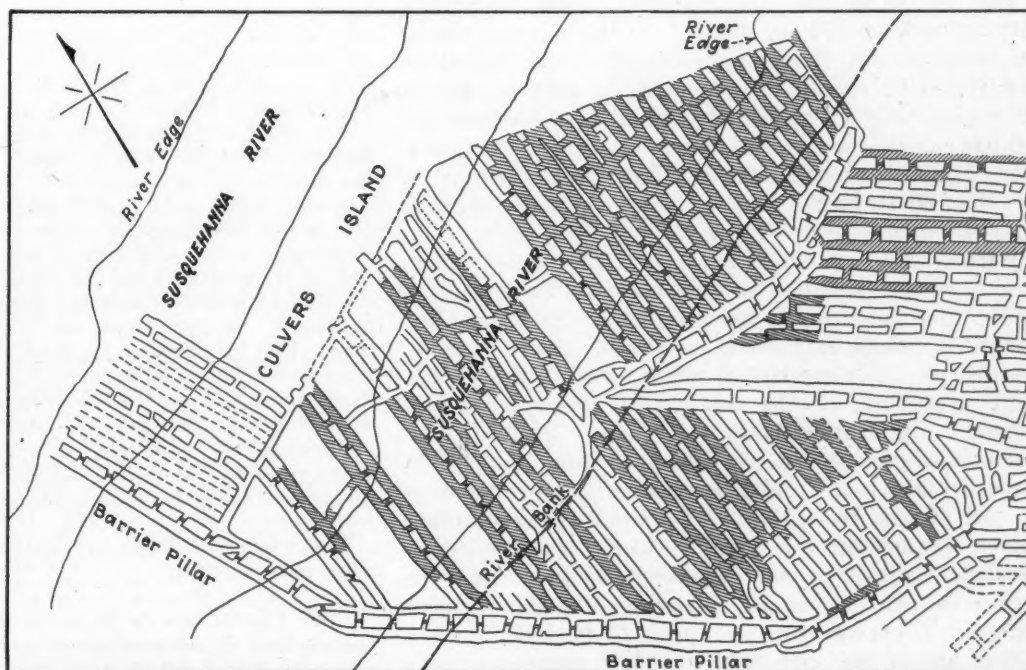




FIG. 2—FILLING HEADINGS WITH ROCK

Rock is brought in mine cars from the breaker, two miles away. Frequently rock barriers are built one by one across the heading, and loose rock is piled in behind them. The coal is over 7 ft. thick, so that in unloading the rock the unloader can get into the car as the man in the illustration has done. The coal rib shown on the left is lost, as is also that on the right also, which cannot be seen.

pletely taken out it is not thought that it will so seriously break the overlying rock that water will flow in from the river.

The greatest difficulty in mining in this vicinity is in the upper beds, where the cover rock is light, the coal of good quality, of reasonable thickness and too valuable to leave. Here great care has to be exercised in the mining so that the roof will not settle and cause cracks that will extend to the surface and permit the inflow of water or quicksand. If this were to happen the operation would have to be abandoned.

At the Cortright slope of No. 14 Colliery of the Pennsylvania Coal Co., between Wilkes-Barre and Pittston, the Hillman bed, which at this place is about 88 in. thick, is being mined. This seam extends under the Susquehanna River and it has only a comparatively light cover. The elevation of the surface of the river is approximately 517 ft. above tide and the elevation of the bottom of the coal is about 420 ft. at this particular point.

The bottom of the coal, however, shows elevations varying between 374 and 432 ft. At the borehole where the elevation first given was taken the wash and river constituted 62 ft. of the cover and the rock is only 25 ft. thick. This thickness of rock is inadequate so no mining can be done at this point. It is not considered safe to mine in places of this character if the rock is less than 50 ft. thick. One company, however, is working coal under a rock cover as light as 30 ft.

With as thin a cover as 50 ft. it is, of course, impossible to remove all the coal, for this would cause surface breaks and water would be admitted to the mine. But though complete extraction is scarcely possible, it is feasible to plan a method of mining that will permit a large proportion of the coal to be removed without danger to the men or the mine.

The method used by the Pennsylvania Coal Co. is distinctly different from that used by other companies in the anthracite region. The usual gangways are driven to develop the area. From these gangways parallel headings, or narrow rooms, as they would be termed in many mines, are driven in pairs and on 30-ft. centers. These headings are about 15 ft. wide, and the pillars are of the same width. They are driven to a

maximum length of about 500 ft. When they have reached their limit they are filled with rock.

This rock is brought from the breaker of the mine, which is located about two miles away. It is transported in the mine cars which take coal to the breaker. The rock is unloaded from these cars and is packed by hand in the rooms. Walls are built at short intervals across the heading and then the rock is thrown back of these walls until it is filled to the roof.

These parallel room pairs are driven so as to leave between adjacent pairs a pillar of 75 ft. and when any two pairs have been driven to their limit and have been rock-filled, another pair of rooms is driven up between them, and when these are finished then these likewise are filled with rock. By this means it is possible to recover about 57 per cent of the coal from the bed, which is an unusually high percentage of recovery from beds of this character. Other companies which do not use rock-filling methods recover only a small percentage of the coal.

It readily can be seen from the illustration that in the first work of this character the recovery was not as great as it has been of late, for when the work was first commenced it was considered necessary to leave larger pillars, and it is probable that the recovery was only about 50 per cent.

Urge Fixing of Standards and Adoption of Net Ton in Coal Industry

Legislation which would fix certain coal standards is favored in a resolution adopted by weights and measures officials from the various states who met in Washington recently at their annual conference at the Bureau of Standards. The resolution pointed out that there are no definite specifications as to coal quality; that the heat values of the various varieties are unknown and that there is no general knowledge as to the effect upon coal when sheltered or exposed. It was the sense of the meeting that suitable action should be taken by Congress "to the end that an adequate legislative remedy be afforded the people of this nation by fixing the proper standards." The conference also recommended that the several states adopt as their standards those fixed by Congress or by its authorized agencies.

Another resolution adopted at the conference provides for the use of the net ton as the universal standard in the sale of coal. The fact that Pennsylvania uses the net ton for bituminous coal and the gross ton for anthracite was cited as indicative of the lack of system in handling the principal unit used in the coal trade.

The third resolution calls upon Congress and upon the legislatures of the several states to enact laws establishing the hundredweight as the unit rather than the bushel for the trade in vegetables, grain and similar commodities. The use of the bushel, it was declared, leads to confusion and presents constant opportunity for fraud. The entire abolition of dry measures was advocated. The conference elected the following officers to serve during the ensuing year: Dr. George K. Burgess, Director, Bureau of Standards, president; Wm. B. McGrady, chief, Pennsylvania Bureau of Standards, first vice-president; I. L. Miller, Commissioner of Weights and Measures for Indiana, second vice-president; F. S. Holbrook, Bureau of Standards, secretary; J. H. Foley, superintendent of Weights and Measures for New Jersey, treasurer. It was decided at this meeting to take up for discussion at next year's conference the whole subject of taximeters.

The tolerances for heavy duty scales recommended last year were adopted.

COAL PRODUCTION OF HUNGARY during 1922 was 7,117,910 metric tons or an average of 593,159 tons per month, as compared with 6,419,861 tons in 1921.

Determining What Is Most Economical Life for a Mine*

Too Much Spent on Some Mines for Maximum of Profit—
Must Consider Not Only Net Earnings but What Sums of
Money Would Earn Annuities Equal to the Several Net Earnings

BY FRANK HAAS

Consulting Engineer, Consolidation Coal Co., Fairmont, W. Va.

CHOICE of this subject was prompted by observing that certain coal mines in Fairmont and other regions had been developed and equipped in a manner that suggested errors in judgment. These errors have not, except in a few instances, made themselves apparent by actual financial failures and some may never be so detected, but the losses of money are inevitable even if not readily perceived.

In the opening of a coal mine the question presents itself—although it is not always seriously considered—as to the amount that should be spent to obtain from the investments the best returns. During the war small economies were overlooked in frantic efforts to get coal and more coal, and some of the things that were done during that desperate period were both warranted and excusable, but in the times that are before us with the prospects that the margin of profit will be cut to a small figure, not only must strict economies be practiced in the operation of coal mines but the executive management in planning what shall be expended on them must likewise take advantage of all the economies that will lower the cost per ton.

We all know in a general way that if a coal property is worked out too rapidly certain losses occur, and the same is true if the process of extraction is extended over too long a period. It is the purpose of this paper to discuss some of the fundamental features which govern such economies and to explain the method of determining what are and what are not economies and to end by drawing some practical conclusions.

The problems involve many factors most of which are beyond control and cannot be anticipated; among these might be mentioned car supply, labor shortage and

fluctuations in operating costs and in the selling price of coal. The effects of such variations are not, however, of a fundamental nature and may be disregarded in considering the subject from a theoretical standpoint. The fundamental features are the size of and price paid for the coal lands, the cost of the plant and equipment, together with the value of money as expressed in percentage rate of interest. In other words it involves only what are ordinarily termed the fixed charges.

An individual or a group of persons, having decided to enter into the industry of producing coal, usually has, or should have, a fairly clear and matured idea as to

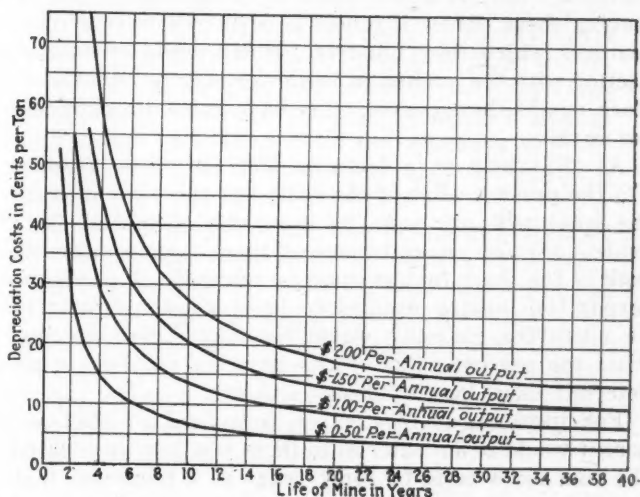


FIG. 2—COST PER TON FOR DEPRECIATION WITH VARYING CONSTRUCTION COSTS

Curves of depreciation run precipitately and then slowly but steadily downward with increased length of mine life, whereas the graphs of depletion as shown in Fig. 1 steadily rise.

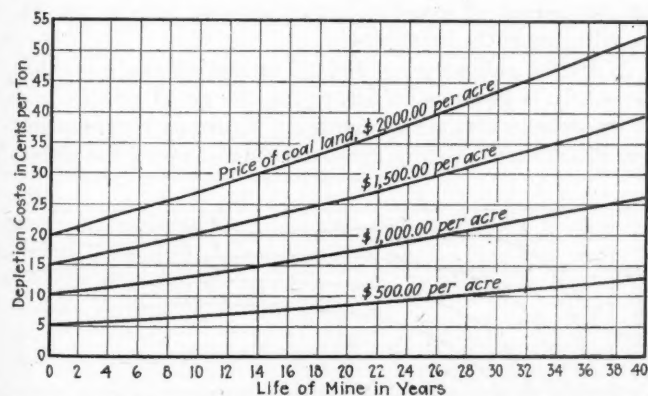


FIG. 1—COST PER TON FOR COAL ON LAND SELLING AT VARIOUS PRICES, ALLOWING FOR INTEREST CHARGES AND RETIREMENT OF CAPITAL

As the coal which is mined in the course of many years is subject to a heavy interest charge the cost of coal per ton increases with the life of a mine in years. If all of it could be taken out on the day of purchase the cost per ton would be the price of the coal land divided by the tons in it. Gradually mined out in forty years it will cost 165 per cent more. In making this diagram the product per acre was assumed to equal 10,000 tons, which is about what may be expected from the Pittsburgh seam in West Virginia.

*Article entitled "The Economic Life of a Mine," read at the West Virginia Coal Mining Institute, Clarksburg, W. Va.

the magnitude of the project as well as a close approximation of what profit is anticipated. Without such preconceived ideas and anticipations one more hazard is being added to a business which by its nature already has many. The selection of the coal lands is the first consideration. In a region so intensively operated as the Fairmont field it is rather a case of what is available, hence the size of the coal field and the price paid is the controlling, if not the most important factor.

We are now ready to discuss what effect the life of a coal field has on the cost of coal and ultimately its value. In Fig. 1 are shown some curves with the life of the mine varying from one to forty years and the cost per ton for different prices per acre of coal. The life of the mine is determined by dividing the recoverable coal by the average output of the mine. The costs per ton represent the charge that must be made to each ton of coal when mined to cover the original cost of the coal and to pay the interest charges at 6 per cent until such capital has been wiped out; these will be referred to as the depletion cost.

It will be seen at a glance that the longer the life the

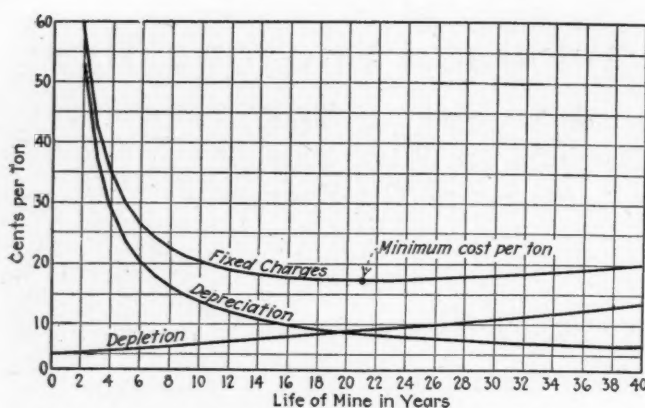


FIG. 3—DEPLETION AND DEPRECIATION GRAPHS
TOTALLED FOR ANY ONE YEAR GIVE A
CURVE OF FIXED CHARGES

The graphs shown here are those based on a value of coal land costing \$500 per acre and a plant expenditure of \$1 per annual ton. This is about one-eighth of the expenditure customary in anthracite mines. The minimum cost per ton is obtained with a life of twenty-one years but this is not the period that would give the greatest earning as further inquiry develops.

higher the cost per ton of coal, and if this was the only factor to consider there would be no problem. Before leaving these curves it might be well to point out some features which they illustrate, which while of no connection with the subject at hand, yet may be of interest. Each one of these curves represents an equivalent basis for royalty.

As the value of a lease depends on three factors, (1) the present value of the coal; (2) the term of years the lease will run and (3) the value of money, it is evident that by changing one of these factors either or both of the other factors must be changed. A person or corporation having decided to lease a coal property to an operating company would logically determine first what the present value of the property is, then would determine how long the lease is to run.

For instance, if they value their land at \$500 per acre it would be immaterial to them whether they leased the coal for a term of forty years at a minimum that would exhaust the area within that time at a royalty of \$0.1329 per ton or leased it for twenty years at double the minimum at \$0.0872 per ton, or finally, sold it for cash at \$0.05 per ton, assuming that it has a merchantable yield of 10,000 tons to the acre, as has the Pittsburgh bed.

Coming back to our original subject we find in depreciation, the second factor, more complications than in depletion. Considering but one object, improvement or machine depreciation is easily and fairly accurately determined, but in the total of plant and equipment of a coal mine we have a large variety of improvements and machines each of which has a specific life and therefore a different rate of depreciation.

To attempt to work out each item separately would be an endless task and while of value for other purposes is not necessary in these calculations. The subject of depreciation has been much discussed and greatly mystified by such terms as "replacements," "betterments" and "obsolescence" which have not been uniformly interpreted and have thereby caused confusion. Depreciation as we expect to use it in this discussion will be simply that the loss of the capital which has been expended on plant and equipment for the purpose of making them produce a certain output.

Taking "one ton per year" as our unit we find that we can determine with fair accuracy how much money

must be expended to produce this tonnage. In the Fairmont region this sum varies from 50c. to \$2. In other words if we attempt to build a mine to produce, say, 100,000 tons per year it will require \$50,000 to \$200,000 to accomplish this, depending on the natural facilities or obstacles encountered. Such things as betterments, replacements and obsolescence exist and care must be taken of them, so I suggest that they be considered as operating cost under repairs and supplies, and we have found that all these questionable features can be grouped and estimated as an annual charge of approximately 5 per cent of the original investment. It will cover all these items.

If this is a constant quantity it is immaterial whether it is included as depreciation or operating cost, and in order to simplify a problem which may to some seem complicated enough we leave it as the second. I am aware that with a small mine the purchase of a haulage motor, for example, would have a considerable effect on the cost sheet of a single month, but this could be handled in a suspense account over a period of a year instead of capitalizing it.

In Fig. 2 is plotted a curve which shows how the average cost of depreciation varies in mines of varying life. It will be noticed that on a short life this cost is prohibitive, but the curves drop off rapidly. The various points on the graph are determined by considering the depreciation charges as an annuity which, divided by the output corresponding to a particular life, gives the cost per ton. The tendency is directly opposite to that of depletion and the diagram plainly indicates that the longer the life the less the depreciation, or its cost per ton.

In Fig. 3 we take a particular case. With the value of coal at \$500 per acre and the cost of the plant and equipment at \$1 per ton of annual production I show both the depletion and the depreciation curve, and as the sum of these two is the total fixed charges I have added a third curve which represents this total. This curve shows a downward tendency at first but reverses the direction to an upward movement. Under the conditions assumed the minimum fixed charge is at a life of twenty-one years. The first impression is that as the cost is at its lowest with a life of twenty-one years this would be the period of greatest earnings, but this is not so, as will presently be shown.

With the selling price and all operating costs per ton known it is possible to determine the gross profits, and if we were to assume an arbitrary figure as representing the gross earnings (by gross earnings I mean the differ-

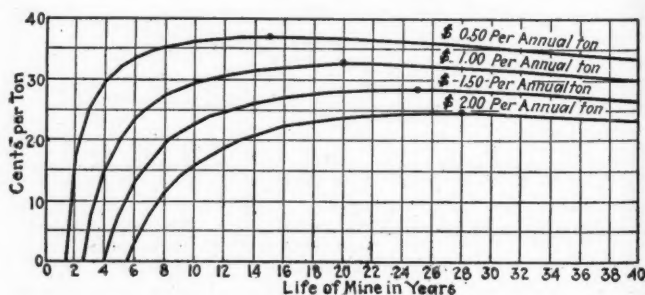


FIG. 4—NET EARNINGS PER TON WITH VARIOUS
CONSTRUCTION COSTS AND MINE DURATIONS

This is based on a coal cost of \$500 per acre and gross earnings of 50c. per ton with the fixed charges deducted. In a mine of short life on which much money has been expended, nothing remains of gross earnings after such deductions because they are so large. This is shown by the fact that all the curves rise from the base or zero line of the figure. In a mine of longer life the net earnings are larger.

ence between the selling price and all costs except the fixed charges) we can determine the net earnings and their relative value.

In Fig. 4 I have assumed a constant figure of 50c. per ton as representing the gross earnings and by subtracting from this sum the variable fixed charges I get a curve showing the net earnings per ton. On this diagram I am still holding to the assumption that the original cost of the coal is \$500 per acre and have introduced four different costs of plant and equipment, 50c., \$1, \$1.50 and \$2 per ton of annual production in order to show the effect of cost of plant and equipment on the economic life of the mine.

This series of curves shows conclusively, so far as annual earnings are concerned, that the economic life of a mine increases with the increased cost of plant and equipment. With an original cost of 50c. per annual ton for plant and equipment the largest average annual net earnings are attained with a 15-year life irrespective of the size of the coal area and irrespective of cost of the coal per acre. For \$1 equipment the life is twenty years; for \$1.50 equipment it is twenty-five years and for \$2 equipment it is 28 years.

We have previously intimated that the highest average earnings do not realize the highest value nor do they indicate the most economic life. The reason for this is that it is not only necessary to know how much money is to be earned but also just when it will be earned. In order to introduce this factor it will be

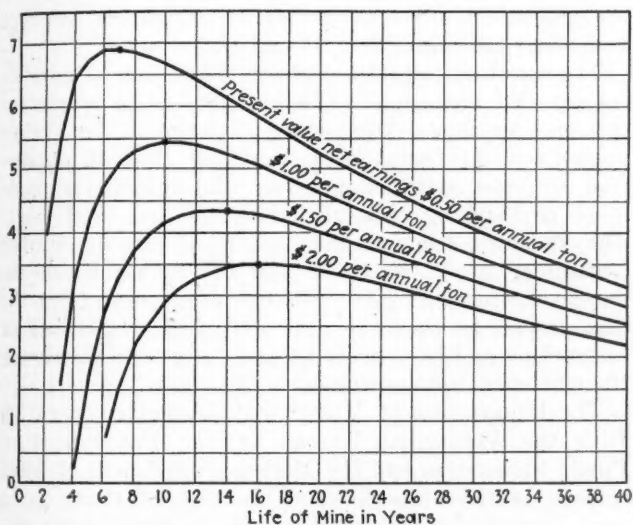


FIG. 5—PRESENT VALUE OF NET EARNINGS

This is based on four different rates of expenditure per ton of annual production with various lengths of mine life.

necessary to establish a fixed time and determine the value of each series of earning. The present time is the most convenient and we have constructed in Fig. 5 four curves which represent the present value of the net earnings.

It is seen in these curves that the most economic life is considerably shortened as compared to and indicated by the highest average earnings per ton. These curves, or rather the maximum points in these curves, give us the answer to our problem. For a mine costing 50c. per ton of annual output the most economic life is seven years. For \$1 equipment it is ten years; for \$1.50 equipment it is thirteen years and for \$2 equipment it is sixteen years, all irrespective of size or cost of the coal field.

Having demonstrated the most economic life of a

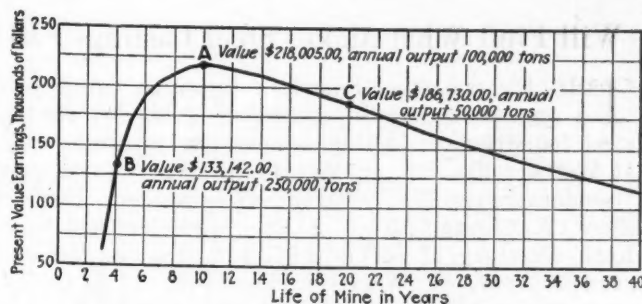


FIG. 6—PRESENT VALUE OF PRODUCT FROM THREE MINES

Here the total production over the life of the mine is 1,000,000 tons in each case. One is exhausted in four years, one in ten years and one in twenty years. According to the author's calculations the mine which is exhausted in ten years brings the greatest profits.

mine we will now attempt to show the practical effect and for this purpose we will assume that three men, indicated by A, B and C, each owning a tract of 100 acres of coal, for which they paid \$500 per acre, with uniform conditions and operating cost and the selling price giving each the same gross earnings, and see what happens to them. A builds a plant and supplies equipment to produce 100,000 tons per year, which would give his mine a life of ten years. B puts in a plant to produce 250,000 tons per year with a life of four years and C puts in a plant for 50,000 tons per year, or a 20-year life. We find as indicated by the curve in Fig. 6: A realizes a profit the present value of which is \$218,005,

B a profit the present value of which is \$133,142 and C one the present value value of which is \$186,730.

Therefore A makes practically 64 per cent more out of his property than B and 17 per cent more than C.

The above comparisons are no exaggeration; in fact greater variations can be found in the Fairmont field. What may to some appear merely a tendency really assumes large proportions and in extreme cases results in disaster from this cause alone.

ALL MEMBERS OF THE STAFF of the U. S. Geological Survey who are available for field work are now thus engaged. R. K. Lyn's party reached Kanatak, southwestern Alaska, June 7. A. I. Jonas is engaged in field work near Westminster, Md. Joseph L. Gillson, who is associated with Edward Sampson in the preparation of a report on the Pend Oreille district, Idaho, is in Washington to complete his part of the report. He will complete this work late in June, when he will join Prof. L. G. Westgate in the examination of the Pioche district of Nevada. Professor Westgate left Delaware, Ohio, for Pioche June 15. A. F. Melcher is continuing work connected with core drilling in the Burbank district, Osage County, Oklahoma. W. W. Rubey is at Moorecroft, Wyo., continuing work on the Black Hills rim. He is being assisted by Alexander Stepanoff. The headquarters of the Spieker party have been changed from Price to Huntington, Utah. Prof. C. R. Longwell, of Yale University, is at Las Vegas for summer field work. Dr. R. C. Moore has been assigned to work as geologist to the Grand Canyon surveying party in charge of C. H. Birdseye. J. B. Mertie, Jr., reached Alaska June 7. G. C. Martin left June 11 to visit some of the oil fields of California. On July 5 he will sail from Seattle to study the geology of the oil deposits of Alaska Peninsula.

THE CONFERENCE ON WASTE IN FREIGHT TRANSPORTATION which was to have been held this month in Washington under Commerce Department auspices has been postponed until such time that it will be possible to have a more representative attendance than could have been obtained on such short notice at this time when traffic men and others interested in transportation are particularly occupied.

Will Find What Makes Steel Castings Fail

THE Electric Steel Founders' Research Group held a regular meeting of executives of the five electric steel foundries conducting co-operative research work, at Wernersville, Pa., on May 14 to May 17. Those in attendance were W. J. Nugent, vice-president, Electric Steel Co., Chicago, Ill.; C. S. Koch, president and H. J. Koch, secretary, of Fort Pitt Steel Casting Co., McKeesport, Pa.; W. H. WorriLOW, president, T. S. Quinn, treasurer, and K. V. Wheeler, general manager, of Lebanon Steel Foundry, Lebanon, Pa.; R. F. Flinterman, president and H. A. Neel, manager, of Michigan Steel Casting Co., Detroit, Mich.; C. R. Messinger, vice-president, E. J. Doty, vice-president, and B. Fleeger, treasurer, Sivy Steel Casting Co., Milwaukee, Wis., and R. A. Bull, research director of the group.

The various phases of the research work being done by the members of the group to improve the quality of steel castings and increase efficiency in methods were discussed in detail. Formal reports giving the status of the present research investigations were read on such subjects as facing sand mixtures, core-sand mixtures, electric-furnace practice, heat treatment of steel castings, production control, porosity in castings, etc.

At this meeting plans were made for conducting research investigations into other problems of steel foundries. The results obtained from the work done so far have been so beneficial as to make it highly desirable to study intensively some of the other complex problems involved in making electric steel castings of thin section and intricate design.

Small Cartridges Inefficient and Unsafe

EXHAUSTIVE tests on the action of explosives in use, when made into cartridges of small diameter, have just been completed by the U. S. Bureau of Mines. They prove that in the interest of safety, economy and efficiency in mining and other work small cartridges should not be used.

"One of the most serious and dangerous features in the use of explosives," says Dr. Charles E. Munroe, "is the frequency with which cartridges 'misfire' or fail to fire. Such cartridges must be eliminated."

The growing use of high explosives by the general public, in addition to their use by the mining, road-building, and agricultural industries, brought about by the constant distribution of surplus war explosives, makes it necessary, Dr. Munroe believes, that the public become better acquainted with explosives and their use. Hundreds of thousands of pounds of dynamite, trinitrotoluol, picric acid, smokeless powder, and other similar high explosives have been and are being distributed throughout the country by the federal government, in order to use up the surplus materials left over from the war. Dr. Munroe has been one of the government's chief expert advisers concerning this distribution. He said:

"The bureau has found that the size of the cartridge used is vital if further economies, additional efficiency and increased safety are to be effected. The tests recently completed prove that we cannot get efficient work from an explosive when it is confined in a cartridge of small diameter. Heretofore, explosive users have believed that they could save money by making small holes and using cartridges of a size suited thereto. That has now been proved to be false economy.

"The bureau's tests prove that we can excavate more ground, blow up and take out more rock and stumps by making larger holes and using larger cartridges. They prove also that the customary and practically standardized cartridge, measuring in diameter 1½ in. and in length 8 in., is small enough in the interest of safety. If it is made smaller, misfires may occur and 'duds' will be left around to be exploded at unexpected moments. For these reasons users of explosives must employ that size in the future."

Pennsylvania Mines Department Co-operates In Plan for Education of Coal Miners

BY FRANK HALL

Deputy Chief, Pennsylvania State Department of Mines

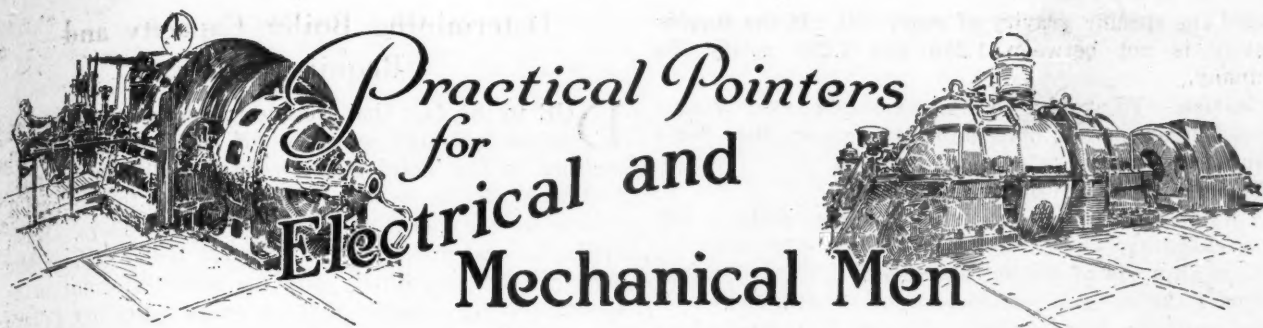
THE advantage of education in all lines of activity is daily becoming more apparent as the demands of modern business grow more exacting and more critical. But the scope of an education should not be limited to the specific things that pertain to a particular occupation; it should include also as much general knowledge as possible, for it is a truism that the better the education, other things being equal, the better will be the service performed.

The Department of Mines of Pennsylvania has found by experience that, even with the most stringent enforcement of the mining laws enacted by the state and the mining rules and regulations formulated by the operators, a large number of casualties occur in and about the mines that should be prevented.

The question naturally arises, What can be done to remedy this condition? One thing to do is to educate the mine workers. The mining department has always recognized this great need, realizing that an occupation so beset with dangers as coal mining is made more perilous by lack of knowledge and inefficiency. The agencies, such as the vocational schools, mining institutes, the Y. M. C. A. and the Scranton schools, have, therefore, all met with encouragement from the department, as they are practical in their methods of instruction and have proved to be a power in increasing the efficiency and carefulness of the mine workers.

The Department of Mines is at present co-operating with the Vocational Bureau of the Department of Public Instruction and the Mining Department of State College in the preparation of courses of study to be used throughout the state in the vocational schools, where miners receive instructions during the evening hours in all branches of the mining industry. The courses are being made comprehensive and include the most modern thought upon all subjects connected with coal mining; but they have been wisely kept in the simplest form possible so that they may afford thorough instruction without demanding too much effort on the part of the student.

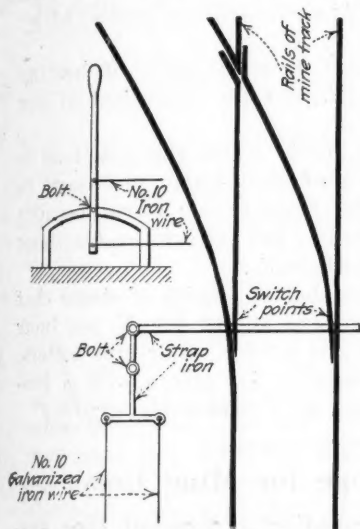
The mining industry of Pennsylvania is so great that there always are thousands of men who are seeking, by educational means, to improve their condition, and it is expected that the courses now being prepared will bring to these ambitious workers an opportunity to acquire a fund of valuable knowledge that will enable them to seek with confidence higher and more responsible positions in and about the mines of the commonwealth. These men will be a potent factor in adding to the intelligent operation of the mines and in bringing about safer conditions for the mine workers.



Simple Mine-Track Switch Thrower

WHERE it is desired to throw a switch when handling several cars, as is frequently the case in mine haulage, I have found the following arrangement very satisfactory and efficient.

A layout such as is shown in the figure herewith is used, which consists of merely lengthening the regular crossbar between the switch points and fastening a



SWITCH-THROWING
ARRANGEMENT

Considerable time may be saved by throwing the switch from the locomotive. Such an arrangement is safer than the usual method of kicking the latch over with the foot.

bolted to a frame. The wires from the T-shaped piece of iron are fastened as shown in the sketch. The upper part of this vertical iron is shaped to make the operation of the lever as easy as possible.

Considerable time may be saved by using this arrangement, as the switch may be thrown from the cars or locomotive without running to the switch points and kicking the switch over with the foot.

Tokay, N. M.

CECIL ROWE,

Assistant Manager, Kinney Coal Mine.

To Overcome Smoke with Low-Volatile Coal

(1) The heat from low-volatile coal comes mainly from the red-hot incandescent coke and not from gas.

(2) To obtain constant heat keep about 75 per cent of the fuel bed in the rear red hot and generally from 8 to 12 in. thick.

(3) Throw green coal in the front part of the fire box, usually 8 to 20 in. high, for the purpose of coking it.

(4) While green coal is in the early stages of coking, smoke will be created, but in flowing over the very hot

fuel bed in the rear it will be consumed and its valuable gases saved.

(5) When the green coal has given off practically all smoke, push it back and level off the fire bed.

(6) In a few moments repeat the process of coking green coal in the front as before.

(7) Do not permit black spots and holes to occur in the fire bed.

—Courtesy W. A. Marshall & Co., New York.

How to Get Best Results from a Battery

IN ORDER to assure best results the following condensed instructions have been issued for the use of Exide Ironclad batteries:

Care.—Solution in cells (the electrolyte) should always cover the plates. To replace evaporation, add pure water only, bringing level to bottom of filling tube.

Add water before a charge or immediately after starting charge. It should not be necessary to add water oftener than once a week. Otherwise the battery is being given too much charge or is too hot.

Never add acid to a cell, except in case solution has been spilled, then replace with new solution of same specific gravity as that of surrounding cells.

Filling plugs should be properly locked in place at all times, except when adding water or taking hydrometer readings.

Cleanliness of the exposed battery parts is very necessary.

If electrolyte is spilled or wood trays or compartment is damp with acid, apply a solution of cooking soda and water, then rinse with water and dry; do not allow soda solution to get into cells.

If this soda treatment is given two or three times a year and the battery kept clean between times by means of weekly washings with water or blowing off with a steam or air jet, the life and service of the battery in general and the trays in particular will be increased considerably.

Discharge.—In ordinary service do not use more than the rated capacity of the battery. In an emergency, take out all that it will give.

Charging.—A charge must always be completed at a rate not higher than about 1 amp. for each plate in a cell; for example, 15 amp. for a 15-plate cell.

A charge may be started at a high rate, provided the current is lowered and never exceeds the reading of the ampere-hour meter, until rate falls to about one ampere per plate.

The temperature of the cells must not exceed 110 deg. F. Open up battery compartment while charging.

An equalizing charge must be given once a week. (See instruction book.)

Once a month, after an equalizing charge, take and

record the specific gravity of every cell. If the specific gravity is not between 1.250 and 1.285 notify the company.

Caution.—To avoid a possible explosion never bring a lighted cigar, match, open miner's lamp or other flame near a battery.

Never lay tools on top of a battery.

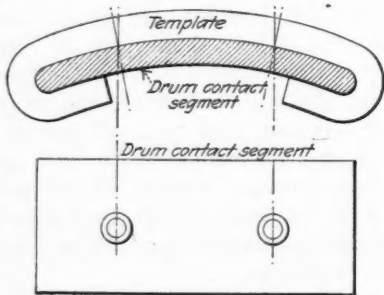
Always remove the covers from the battery box when charging.

Keep all parts of the battery clean.

For Detailed Instructions.—The instruction book gives complete information. Read it and obtain best results from the battery. For this book or other battery information, write to the company, specifying in what service the battery is used—whether in mine locomotive, industrial truck, street truck, etc.

Mine-Made Controller Segments

DRUM segments can easily be made in the mine shops. The diameter of the controller drum with the drum segments removed should be taken. This will be the inside diameter of a copper tube of suitable thickness, which, when cut up, will provide drum segments with the same curvature as those already in use. The copper tube may be purchased in lengths of a few feet, being placed in a lathe and cut into rings of the required width. These are then cut up as required. The drum segments should have their holes accurately drilled, and they should be interchangeable. Therefore it is best to make them in a template as shown in the figure. This can be made out of $\frac{1}{4}$ -in. or $\frac{3}{8}$ -in. iron. It should be shaped and drilled to a new drum segment supplied by the makers, the same one being kept as a standard. The template and drum segment should be the same width so that when the latter is inserted and entirely covered by the template the holes will be drilled in the proper location.



TEMPLATE FOR LOCATING THE HOLES IN CONTROLLER DRUM SEGMENTS

Accuracy in the location of the segments of the drum cylinder is important if arcing is to be kept at a minimum.

Drum segments of course burn on only one end, and therefore they should always be reversed in order to get out of them the maximum service. A spare set of these should be kept so that no filing is done in the controller.

When filing a drum segment the end should be properly rounded as shown in the figure. This insures a quick connection where the moving drum segment encounters the fingers. If they are filed at an angle as shown dotted, then contact is established and broken much more slowly, and burning is more severe.

R. F.—E.

H. F. YANCEY, assistant chemist, and Thomas Fraser, assistant mining engineer at Urbana (Ill.) experiment station of the Bureau of Mines, have completed a preliminary study taken to determine the amenability of coal to improvement by the dry-cleaning process. The distribution of the impurities in all of the coals was found to be such as to make them amenable to treatment by either the wet or dry process.

Determining Boiler Capacity and Requirements

DUE to the fact that the electric load at one of our mines has high peaks but of short duration, I am inclined to the belief that a very large boiler installation is hardly necessary. In proportion to the load I believe we are operating too many of our boilers. Much of the time we are working under the boiler horsepower rating. Will you kindly give me some information as to evaporating capacity of the average boiler per square foot of heating surface, the heating surface required per boiler horsepower and the possibilities of working boilers above their normal rating for short periods.

MINE PLANT OPERATOR.

The best efficiency under ordinary working conditions with most boilers, is obtained when evaporating about 3 lb. of water per square foot of heating surface per hour, from a feed temperature of 212 deg. F. into steam at atmospheric pressure. This is equivalent to allowing nearly 12 sq.ft. of heating surface per boiler horsepower.

However, at the present time 10 sq.ft. of heating surface ordinarily is considered the equivalent of one boiler horsepower.

In electric generating plants where the heat load is of short duration it is not particularly necessary to have the capacity of the boilers too liberal because most boilers may be pushed to 200 per cent load without seriously affecting their efficiency.

By dividing the total number of pounds of steam that are to be evaporated from and at 212 deg. F. per hour by 3 for fire-tube boilers and 3.4 for water-tube boilers, the amount of heating surface for plants with a constant load may be obtained with reasonable accuracy.

Plow Steel Rope for Mine Uses

FOR mine haulage, including endless-tail rope systems, gravity hoists, as well as coal-dock haulage and roads operating small grip cars a plow-steel transmission rope may be used to great advantage. When replacing a softer crucible steel rope where it is necessary to obtain increased strength and the physical requirements render it impossible to alter the working conditions a plow-steel rope may be used to distinct advantage. Under these conditions it is rarely necessary to increase the diameter of the rope.

A plow-steel transmission or haulage rope made up of six strands of seven wires per strand and having a hemp center has the following qualities when properly made:

Diameter in Inches	Circumference in Inches	Approximate Weight per Foot in Pounds	Approximate Strength in Net Tons	Proper Working Load in Net Tons	Diameter of Drum or Sheave in Feet Advised
1 1/4	4 1/2	3.55	82	16.4	11
1 1/2	4 3/4	3	72	14.4	10
1 3/4	5	2.45	60	12	9
2	5 1/2	2	47	9.4	8
2 1/4	6	1.58	38	7.6	7
2 1/2	6 1/2	1.20	31	6.2	6
2 3/4	7	0.89	23	4.6	5
3	7 1/2	0.75	18	3.6	4 1/2
3 1/4	8	0.62	16	3.2	4
3 1/2	8 1/2	0.50	12	2.4	3 1/2
3 3/4	9	0.39	10	2	3
4	9 1/2	.30	7	1.4	2 1/2
4 1/4	10	.22	5.9	1.2	2
4 1/2	10 1/2	.15	4.4	0.88	1 3/4
4 3/4	11	.12 1/2	3.4	0.68	1 1/2

PARTY LINES MAY BE DISAPPEARING in this country, but coal lines are forming.—*Brooklyn Eagle*.



How Many More Years Can Southwestern Coal Fields Keep Up Heartbreaking Fight Against Oil?

Lower Costs Are Vital Yet Unions Even Refuse 11c. Machine Differential—Coal Loses More Than 12,000,000 Tons of Market Among Railroads, Industries and Homes

BY C. F. BUTCHER
Kansas City, Mo.

A MAN familiar with coal conditions in the southwestern district, one who has diagnosed afflictions of the industry with considerable accuracy in times past, has given the mines of Kansas, Oklahoma, Arkansas and Missouri "ten years more to live." In his opinion the industry is gradually succumbing to the high cost of production, and oil and electric competition. A cut in costs is a vital necessity.

It is a district capable of normal production of more than a million tons of coal a month with present equipment. At such a rate of production, in acreage now being developed, it should have a natural expectation of at least fifty years more of activity. It has undeveloped acreage estimated potentially to be good for from 300,000,000 to 600,000,000 tons additional. This is the Southwest's armor against exorbitant oil prices. It will always be ready to yield coal for every purpose. Yet there is no doubt of the sincerity of coal men who say the sun is setting on Kansas, Arkansas, Oklahoma and Missouri coal.

The "ten years" statement was repeated to many operators recently. Although not all are as pessimistic as that, they agreed that Old King Coal is a sick man at least as affects that part of his anatomy distributed over these four states. But, as one views the situation, it is well to bear in mind the admonition with which the general commissioner of the Southwestern Interstate Coal Operators' Association concluded a survey of conditions in the district for members of the association. "The coal industry," he wrote, "has in the past survived many adversities, and will no doubt be equal to the task of readjusting itself under these circumstances."

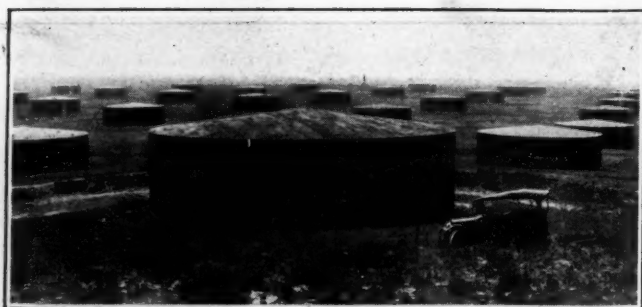
NOTE—Headpiece shows typical Oklahoma oil field, spiked with derricks, laced with pipe lines and spotted with field storage tanks from which main pipe lines carry oil to refineries any distance from 15 to 200 miles.

The high wage scale of last year remains effective for another year. Concerning the possible trend of wages or the stability of labor after the expiration of the existing contracts, no one will risk a guess. Operators attribute to present high operating costs much of the success of competitive fuels. And so far there is no sign of operators and miners coming closer together.

The other day a conference of representatives of operators and miners adjourned in Kansas City after arguing intermittently more than six weeks over a difference of 5c. in a machine scale differential for Kansas mines, where it is proposed to install machines. Operators offered an 11c. differential—the miners demanded 6c. About the time the conference adjourned, miners of Jackson-Walker mine No. 16, in the southeastern Kansas field, were petitioning Governor Jonathan Davis to force the company to resume work in the mine, which had been shut down because of lack of business. This indicates the attitude of union miners toward the obliteration of their jobs.

The competition of electricity is steadily increasing. In 1922 public-utility power plants produced and distributed an average of approximately 85,000,000 kw.-hr. of electric energy a month, while new projects are under way for centralizing the electrification of almost every town of 5,000 or more people in eastern Oklahoma, eastern Kansas and western Missouri into a dozen or so large power plants. In addition to making it possible to substitute electrical energy for steam in many plants now using boilers, engineers for the interested power companies estimate that centralization will effect a reduction of 20 to 25 per cent in the amount of fuel required for their plants.

And finally, there is the constant encroachment of fuel oil upon the coal market. Immediately before,



"TANK FARM" IN THE CENTER OF A GREAT SOUTHWEST PRODUCING FIELD

Here oil is collected by millions of gallons for general field storage on its way out of the region via one of the several main pipe lines. The bulk of the oil shipped out of the Southwest field never uses a tank car nor does it clutter up a railroad en route.

during and since the war, oil production in the mid-continent field has grown by leaps and bounds. Great new fields have been opened in Oklahoma, Texas, Arkansas and Kansas. A network of pipe lines has been laid over the states, affording economical transportation to refineries and loading points. No strikes have occurred in the oil fields to tie up production, and selling agencies have not overlooked the argument afforded by this fact in seeking replacement of grates by oil burners.

Before the war, oil competition was negligible. There was some experimentation, but for the most part such plants as installed oil burners vacillated from coal to oil and from oil back to coal with the fluctuations in price of the two fuels. During the war there was such a demand for all forms of fuel that no effort was made to tabulate the comparative popularity of the various types. It was not until the autumn of 1919 that any attempt was made to discover the relative positions of coal and oil in the Southwest. At that time, W. L. A. Johnson, general commissioner of the Southwestern Interstate Coal Operators' Association, requested from all coal-selling organizations of the Southwest the names of their customers who had replaced grates with oil burners and the amount of coal displaced in each plant. The replies to the query, as submitted to the Bituminous Coal Commission in Washington, D. C., early in 1920, revealed that in 385 establishments, including both industrial plants and railroads, 12,484,750 tons of coal a year was being displaced by fuel oil. Displacement in industrial plants was 5,881,900 tons and on railroads 6,602,850 tons. No survey has been made since, but there has been a steady increase in displacement in the last two years.

In considering these returns it must be borne in mind that they are for ten states, and embrace territory supplied only in part by mines of Kansas, Arkansas, Oklahoma and Missouri. Even so, the total is startling, exceeding as it does the total production of coal in the four states in either 1921 or 1922.

In Kansas City alone in 1922 oil displaced some 695,000 tons of coal. Of this displacement, approximately 542,000 tons was industrial, 153,000 tons domestic. On May 1, 1922, there were 9,220 oil burners in Kansas City domestic heating plants. Now there are in the neighborhood of 15,300. This increase in the summer of last year is attributed largely to the uncertainty of labor conditions. The public had no assurance that the strike would be settled before winter. It had had previous experience with "coal famines" produced by labor troubles and with prices prevailing at such times. The skyrocketing of prices on such coal as was obtainable in the summer augmented its fears.

So with industries. Rather than risk a shut-down for lack of fuel, many companies installed oil burners.

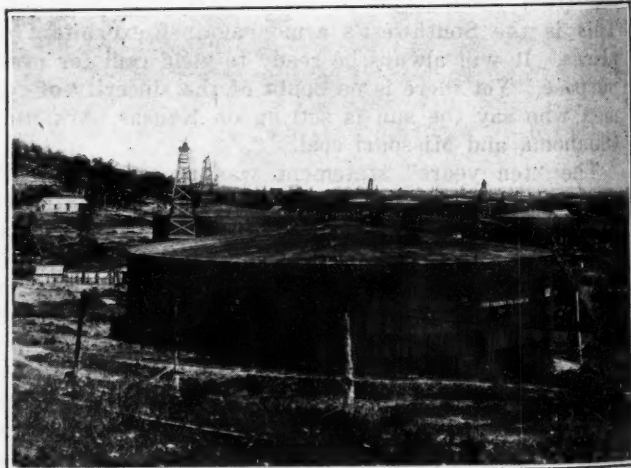
Railroads are converting virtually all their divisions south and southwest of Kansas City to oil. Almost every railroad of the Southwest and the middle South taps one or more of the scores of immense pools of Texas, Arkansas, Oklahoma and Kansas. Transportation costs are reduced by the proximity of the lines to the fields. Within a few months the southern divisions of the Frisco, Katy, Rock Island, Santa Fe, Missouri Pacific, Southern Pacific, Kansas City Southern and Cotton Belt all will be using oil exclusively. All roads in Texas already are using only oil.

It is considered probable that the Southern Pacific will install oil on its transcontinental lines. It has contracted for the erection of a steel storage tank at Lordsburg, N. M., that will have a capacity of 2,500,000 gallons. A recent contract made by the Missouri Pacific with the Great American Oil Co., to run three years, provides for oil to be used on all southern divisions of the system. The company will erect twenty-three 55,000-barrel steel storage tanks, and expects to equip 100 locomotives with oil burners, at a cost of \$200,000.

The Cotton Belt recently contracted with the Houston Oil Co. for 4,000,000 barrels of fuel oil to be used at the rate of 10,000 barrels a day. It is equipping 119 locomotives with burners, and is building storage tanks with a capacity of 500,000 barrels. The Frisco has a three-year contract for fuel oil to be used on its Southwestern lines. The Rock Island recently announced its intention to convert all locomotives to oil, and to close its mines in Hartshorne and Haileyville, Okla., until the cost of producing coal is reduced. The Katy is burning oil in all engines running between Parsons, Kan., and Denison, Texas, and in its shop boilers at Parsons.

These changes entail a coal-market loss of approximately 30,000 tons a day.

As to comparative costs of the two fuels there is no agreement. Purchasing agents for companies using coal say coal costs less to use than oil. Those for plants burning oil swear oil is the cheaper—that the greater initial cost and the expense of substituting burners for grates is offset by a cheaper handling cost. Most home owners who have substituted oil for coal agree that, in addition to the cost of necessary changes in their heating plants, their oil bills run from 20 to 25 per cent greater than did their bills for Arkansas



IF COAL MINING SPOILS LANDSCAPES, WHAT DOES OIL MINING DO?

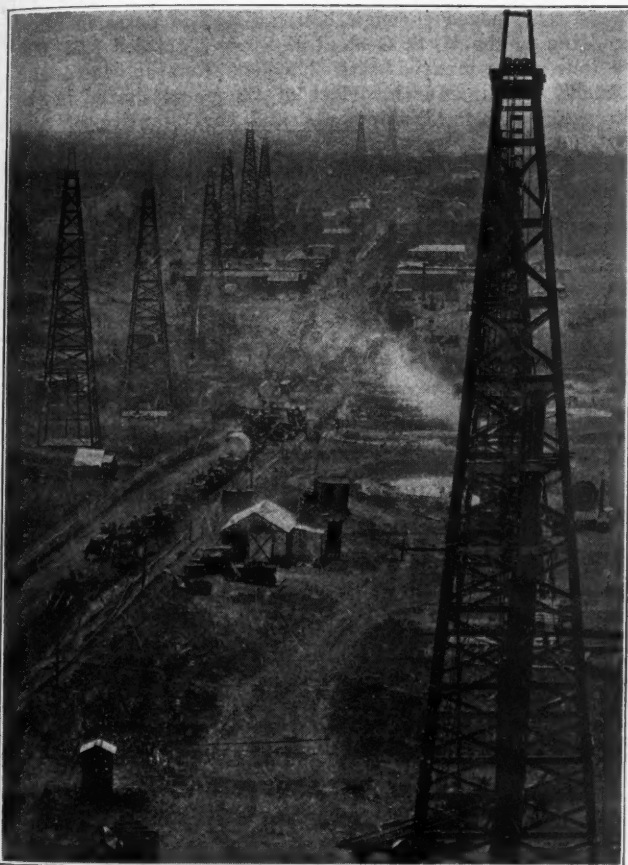
This countryside yielded its every claim to beauty and devoted itself to raising this crop of derricks and hulking odorous tanks which help to keep pipelines full and give the producer a chance to keep his wells pumping even though the demand may be slack.

TABLE I—INCREASE OF ELECTRIC POWER GENERATED IN THE SOUTHWEST WITH AMOUNTS OF FUEL CONSUMED *

ARKANSAS					
Year	Kw.-Hr. Produced by Water	Kw.-Hr. Produced by Fuels	Coal, (Net Tons)	Fuels Consumed Oil, (Barrels)	Gas, (M. Cu. Ft.)
1920	1,373,000	117,337,000	123,019	83,816	2,698,740
1921	1,438,000	123,014,000	128,539	155,355	1,954,493
1922	1,649,000	139,074,000	94,310	224,654	2,015,185
KANSAS					
1920	20,508,000	417,144,000	472,771	821,383	1,481,295
1921	21,231,000	393,999,000	282,892	1,056,152	2,160,040
1922	17,040,000	477,893,000	242,168	1,359,265	3,216,445
MISSOURI					
1920	46,044,000	652,181,000	1,190,148	448,837	.....
1921	41,238,000	681,082,000	1,092,616	225,840	.....
1922	29,250,000	841,849,000	1,160,068	519,735	.....
OKLAHOMA					
1920	2,006,000	211,822,000	102,072	345,685	5,608,484
1921	2,343,000	212,275,000	70,029	552,308	4,503,294
1922	5,337,000	238,756,000	61,176	507,140	4,547,636

* Based on returns from plants producing 10,000 or more kw.-hr.

semi-anthracite, the domestic coal most generally used in Kansas City. "But," they explain, "there are no strikes in the oil fields. We know we can get fuel oil



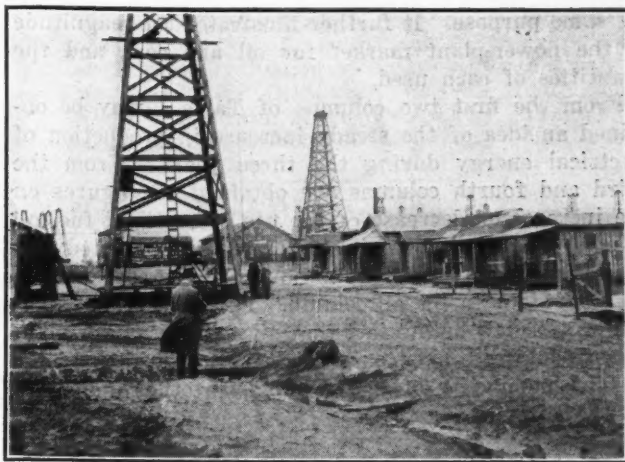
THE KLONDIKE RUSH HAD NOTHING ON A RUSH FOR OIL

When a strike is made a new field sprouts up overnight. Roads begin to run oil, machinery, tanks and pipe. Shacks are thrown together, gangs throng in from everywhere and nowhere, drills bore day and night, everything is forgotten by oil men except that a pool of oil is right there under their feet and that the first man into it begins to cash in first. Reckless waste marks every move.

as long as the railroads run." This likewise is the reason most frequently heard among industrial buyers for converting to oil.

And yet last autumn, as soon as it became apparent that the labor situation in the coal fields was more or less stabilized, several plants which had been using oil during the months of uncertainty returned to their grates. Among them was the Armour packing plant, one of the largest industrial fuel buyers in Kansas City.

As this is written fuel oil is quoted by the tank car, f.o.b. Oklahoma shipping points, at \$1.15 a barrel.



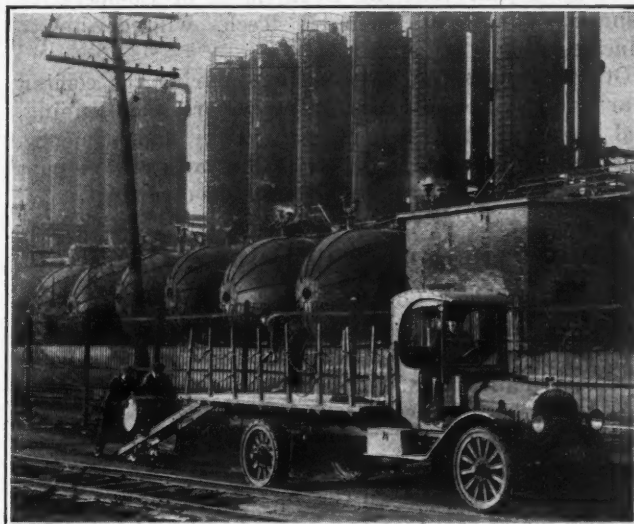
COAL MINE TOWNS SHINE BY COMPARISON

While of course there are oil companies which build comfortable houses for employees, the footloose oil man must hop around suddenly from place to place, and his home usually is a shack like one of these. The wooden box in the foreground has a "Rooms for Rent" sign on it.

Kansas coal, f.o.b. mines, is \$4.50 for lump, \$4 for nut, \$3.50 for mine-run, and \$2.50 for screenings. Taking $4\frac{1}{2}$ barrels of fuel oil as the equivalent of one ton of Kansas bituminous in B.t.u. value, it is apparent that oil to do the work of one ton of coal would cost \$5.175.

Electricity forms the third point of the competitive fuel triangle. But, whereas its participation in the competition is more or less simple, electric power itself provides a market for which its two competitors must struggle. And although each month the U. S. Geological Survey publishes statistics on the number of kilowatt-hours produced by water power, and by various fuels in each state, engineers refuse to attempt to estimate the amount of fuel displaced by a specified number of kilowatt-hours of electrical energy. Such a compilation, they say, would be affected by too many unstable factors to be made to apply generally through all industries. It would vary for each plant.

Table I, taken from the Geological Survey, does show, however, a steady increase in the production of electrical energy in the four states in the last three years accompanied by a steady increase in oil burned to generate electricity and a decrease in coal consumed for



THE "TIPPLE" OF THE OIL INDUSTRY

About 500 refineries of various sorts raise their distilling columns in air in various large communities near the oil fields. Here the gasoline and gas oils are removed, leaving approximately 20 per cent of the original volume, which is fuel oil.

the same purpose. It further illustrates the magnitude of the power-plant market for oil and coal, and the quantities of each used.

From the first two columns of Table I may be obtained an idea of the steady increase in production of electrical energy during the three years. From the third and fourth columns are obtained the figures on the increase or decrease of the use of coal and fuel oil in power plants shown in Table II. It will be noted that the minus signs are in the majority in the coal column, the plus signs in the oil column. This is especially significant in view of the fact that oil men say power-plant reports may be taken as a fairly accurate gage of the relative popularity of the two fuels in other industries of the district.

TABLE II—INCREASE OR DECREASE IN AMOUNT OF COAL AND FUEL OIL CONSUMED BY PUBLIC UTILITY-POWER PLANTS

Year	ARKANSAS	
1921.....	Coal (Tons)	Oil (Bbls.)
1922.....	+5,520	+71,539
	-34,229	+69,299
KANSAS		
1921.....	-189,879	+234,769
1922.....	-40,724	+303,113
MISSOURI		
1921.....	-97,532	-222,997
1922.....	+67,452	+293,895
OKLAHOMA		
1921.....	-32,043	+206,623
1922.....	-8,853	-45,168

Research Fellows Study Dust Explosions, Heat Conductivity and Stray Current

A STUDY of the factors causing mine explosions will be made at Carnegie Institute of Technology. The study of mine-explosion causes will be divided into investigations of (a) modification of Stokes law for settling of coal-dust particles; (b) time-pressure relations in dust explosions; (c) conductivity and specific heat of coal; (d) static charges in coal mines; and (e) effect of electric field in propagation of explosions.

Six college graduates will be appointed to research fellowships to conduct the investigations in co-operation with the U. S. Bureau of Mines and an advisory board of Pittsburgh coal operators and mining engineers. September, 1923, will mark the beginning of the third consecutive year that the Department of Co-operative Mining Courses at Carnegie Tech. will devote to mine research.

Other subjects for investigations during the coming year will be geology, acid mine waters, coal mining, coal washing, utilization of coal, safety and efficiency, and coal storage. The results of the work will be published at the end of the ten months devoted to it.

Magnitude in Anthracite Mining Operations

FROM President Loree's remarks at the banquet in celebration of the centennial of the Delaware & Hudson Co. it may be possible to get some idea as to the large quantities of material used and of the magnitude of the work performed at anthracite collieries. As he well says:

"Some of the mechanical measurements are startling. This company elevates to the surface 14 tons of water for each ton of coal that is prepared and sent to market from its mines. The mine tracks, underground, in its collieries, have a combined length of 650 miles, or more than two-thirds the length of the great railway system that has been developed incident to the market-

ing of the coal. Each miner is a shipper, who must have several mine cars delivered one at a time during the day, and 20,000 of these cars have been loaded and unloaded in one working day.

"Anthracite is recovered from ten to twelve super-imposed beds at a single operation, each bed extending over an area of from 8 to 10 square miles, making a total of from 80 to 120 square miles for one colliery operation. Owing to the greater depth of anthracite mines and the complicated and costly apparatus required in the preparation of hard coal, the present cost of a new operation capable of an annual output of 1,000,000 tons is about \$8,500,000 for the anthracite region, whereas in the bituminous fields the average cost of a plant capable of similar output would be approximately \$2,500,000."

Bituminous Movement to Tidewater in May Exceeds That of March and April

Soft coal moved through North Atlantic ports in May, according to the U. S. Geological Survey, totaled 3,731,000 net tons, as compared with 3,366,000 tons in April and 3,315,000 tons in March. Each of the ports shared in the increase. The total shipments and the quantity of coal exported in May were larger than at any time since the summer of 1921. Coastwise shipments to New England decreased.

TIDEWATER BITUMINOUS COAL SHIPMENTS FOR MAY, 1923 (Net Tons)

Destination	New York	Philadelphia	Baltimore	Hampton Roads	Charleston	Total
Coastwise to New England.....	182,000	115,000	114,000	718,000	.....	1,129,000
Exports.....	1,000	74,000	329,000	405,000	38,000	847,000
Bunker.....	250,000	45,000	65,000	182,000	5,000	547,000
Inside capes.....	.....	198,000	180,000	32,000	.....	410,000
Other tonnage.....	565,000	.....	9,000	219,000	5,000	798,000
Total.....	998,000	432,000	697,000	1,556,000	48,000	3,731,000

Retail Anthracite Sales in Massachusetts Fell Off 20 Per Cent in 1922-3

Distribution of domestic anthracite by the retail dealers of Massachusetts fell off 1,100,000 tons, or about 20 per cent, in the coal year 1922-1923 as compared with the previous coal year. The detailed figures, in net tons, including the monthly receipts shown below were compiled by the Massachusetts Special Commission on the Necessaries of life:

Stocks on hand April 1, 1922.....	726,611
Receipts, April, 1922.....	226,312
May.....	98,801
June.....	97,668
July.....	70,847
August.....	46,871
September.....	95,059
October.....	449,681
November.....	449,853
December.....	472,777
January, 1923.....	476,169
February.....	472,210
March.....	609,627

Available for distribution.....	4,292,486
Stocks on hand April 1, 1923.....	181,887

Distributed in year.....4,110,599

Stocks in the dealers' yards on April 1, 1923, were considerably less than in previous years, as shown below:

Stocks on hand in dealers' yards, in net tons:

April 1, 1920.....	342,925
April 1, 1921.....	803,029
April 1, 1922.....	726,611
April 1, 1923.....	181,887

Receipts of anthracite through the New England rail gateways show 458 cars per day during April to the 23rd. The daily average receipts of anthracite in the 1921-1922 coal year through these gateways was 417 cars per day.

ALMOST ANY SYSTEM of government will work if the people will.—*Springfield State Register.*

West Virginia Mining Institute Discusses Mine Development, Fires and Housing

Many interesting papers were read at the twenty-seventh semi-annual meeting of the West Virginia Mining Institute held in Clarksburg on June 12, 13 and 14, over which Professor A. C. Callen, of Morgantown, head of the department of mining engineering of the West Virginia University, presided. Hugh G. Scott of the Smith Bros. Coal Co., of Clarksburg, delivered the address of welcome, response to which was made by J. B. Hanford, of Morgantown, president of the institute when first organized in Clarksburg about 15 years ago.

J. W. Knowlton, chief of the testing department of the West Virginia Coal & Coke Co., of Elkins, read the first paper entitled: "What the Future Holds for Coal." Mr. Knowlton in his address said that the difference between prosperity and business depression is only 10 to 20 per cent instead of 100 per cent as many were inclined to believe.

He expressed the opinion that there was no need for the opening of additional mines, stating that there were sufficient plants to meet the needs of the present and the immediate future. He said that was especially true in this age of the utilization of coal when central power plants and byproduct plants are employed to utilize fuel to its greatest extent. Mr. Knowlton thought that the principal problem to be solved in the future was that of transportation and that the main difficulty in obtaining our fuel supplies would lie not so much in the mining as in the moving of coal.

An interesting paper on "The Economic Life of a Coal Mine" was read by Frank Haas, consulting engineer of the Consolidation Coal Co. of Fairmont. His paper was of a technical nature and appears on another page in this issue of *Coal Age*.

In reading a paper on "Informing the Consumer as to the Hazard and Expense of Coal Production," Captain W. J. German, technical representative of E. I. du Pont de Nemours & Co., of Huntington, contended that the coal industry should let the general public know more of the various hazards and expenses entering into the costs of producing coal. Captain German illustrated what he meant by saying that he had had occasion to ascertain in Chicago not long ago just what the public knew about coal mining. The answers he had received disclosed the fact that people in general were under the impression that coal lies in thick deposits and that all the work to be done was to dig it and roll it into railroad cars.

Dr. C. L. Jones, of the Mellon Institute of Pittsburgh, talked of entirely new methods in fighting mine fires in a paper on "Fighting Mine Fires with Carbon Dioxide." He mentioned the fact that the coal in the Bitner mine of the H. C. Frick Coke Co., near Connellsville, Pa., had been burning fully two months before the fire was checked by resorting to the use of carbon dioxide. He also stated that those connected with the company have expressed the belief that the fire could not have been extinguished if carbon dioxide had not been utilized.

Dr. Jones described how stoppings were built and the entire area sealed. Then carbon dioxide was injected through boreholes through which water was forced to extinguish the flames. It was stated by Dr. Jones that 230,000 lb. or the equivalent of 4,600 tanks which hold 450 cu.ft. of carbon dioxide were used in the successful drive to extinguish the mine fire. He said that the success of the treatment at the fire described has been due to sealing off the area of fire; cooling the temperature of the area by means of water; the smothering effect of carbon dioxide and the fact that the gas to a certain extent prevents the inflow of outside air to the fire area during the period of contraction.

Other papers read at the meeting were "Housing the Coal Industry," by L. Brandt, of Pittsburgh; "The Low Temperature Distillation of Coal," by R. D. Lamie of the Huntington Coal Distillation Co., of Huntington; and "Where to Build Our Mining Towns," by Thomas F. Downing, Jr., general manager of the Lundale Coal Corporation, of Lundale, W. Va.

Production of Byproduct and Beehive Coke Continued to Gain in May

Output of byproduct coke in May, according to the U. S. Geological Survey, was 3,328,000 net tons, an increase of 122,000 tons, or 3.8 per cent, over the April output. This gain was partly due to the greater number of working days and partly to an increase in the average daily rate of production. The quantity of coke produced was 89.2 per cent of the capacity of plants in existence. The total count of plants is now 69, two formerly reported separately having been consolidated. Of these, 63 were active and 6 idle.

The production of beehive coke also increased in May. The output was 1,829,000 net tons, as compared with 1,776,000 tons in April. Thus the total output of all coke was 5,157,000 tons, of which byproduct coke constituted 64.5 per cent and beehive coke 35.5 per cent.

MONTHLY OUTPUT OF BYPRODUCT AND BEEHIVE COKE IN THE UNITED STATES ()

	Byproduct Coke	Beehive Coke	Total
1917 Monthly average.....	1,876,000	2,764,000	4,634,000
1918 Monthly average.....	2,166,000	2,540,000	4,706,000
1919 Monthly average.....	2,095,000	1,638,000	3,733,000
1920 Monthly average.....	2,565,000	1,748,000	4,313,000
1921 Monthly average.....	1,646,000	462,000	2,108,000
1922 Monthly average.....	2,374,000	669,000	3,043,000
March, 1923.....	3,256,000	1,749,000	5,005,000
April, 1923.....	3,206,000	1,776,000	4,982,000
May, 1923.....	3,328,000	1,829,000	5,157,000

(a) Excludes screenings and breeze.

Coal consumed in the manufacture of coke in May is estimated at 7,667,000 net tons, of which 4,782 tons was used in byproduct ovens and 2,885,000 tons in beehive ovens. The following table presents for comparison the average monthly consumption of coal for coke-making during the past six years.

ESTIMATED MONTHLY CONSUMPTION OF COAL FOR MANUFACTURE OF COKE a

	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	Total Coal Consumed
1917 Monthly average.....	2,625,000	4,354,000	6,979,000
1918 Monthly average.....	3,072,000	4,014,000	7,086,000
1919 Monthly average.....	2,988,000	2,478,000	5,466,000
1920 Monthly average.....	3,684,000	2,665,000	6,349,000
1921 Monthly average.....	2,401,000	706,000	3,107,000
1922 Monthly average.....	3,411,000	1,056,000	4,467,000
March, 1923.....	4,679,000	2,759,000	7,438,000
April, 1923.....	4,607,000	2,801,000	7,408,000
May, 1923.....	4,782,000	2,885,000	7,667,000

(a) Assuming a yield in merchantable coke of 69.6 per cent of the coal charged in byproduct ovens and of 63.4 per cent in beehive ovens.

Railroad Reports Show Amount of Coal Carried by Roads Last Year

The following statistics from annual reports of railroads give the coal and coke freight tonnages moved by the carriers during the calendar years 1921 and 1922. Originating tonnage as well as that received from connections are included in these totals, which are all in gross tons.

	Anthracite		Bituminous		Coke	
	1922	1921	1922	1921	1922	1921
N. Y., N. H. & H.....	2,026,680	3,433,352	3,926,888	3,475,663	210,337	126,393
Long Island R. R.....	1,358,558	1,754,093	350,790	285,625	22,436	13,941
Norfolk & Western.....	5,582	12,216	28,120,614	21,766,196	377,185	320,514
Delaware & Hudson.....	6,875,436	13,007,505	2,298,734	2,933,504	51,543	83,787
D. L. & W.....	6,321,512	10,713,233	1,969,610	1,646,569	216,276	172,067
Pennsylvania.....	7,463,731		76,977,309		5,849,090	
Lehigh Valley.....	7,931,540	13,028,065	1,848,877	1,793,941	170,392	43,184
Virginian.....	15,903	13,225	6,558,854	5,691,790	26	313



Problems of Operating Men

Edited by
James T. Beard



Disposal of Slate Refuse When Working Twin Coal Seams

Complete Extraction of Coal a Controlling Factor—Method of Working Adopted an Important Consideration—Advantage in Longwall Plan

IN TWO recent articles that appeared as *Inquiries* in that department of *Coal Age*, attention has been drawn to the economic disposal of slate refuse. The first of these inquiries appeared in the issue of April 12, p. 608, under the title "Gobbing Slate in Rooms in Mines." The second is found in the issue of May 10, p. 762, under the title "Working Coal Seams With Heavy Slate Parting."

In treating this question, due regard must be had to the efficiency of the operation; but probably the controlling factor is the complete extraction of the coal made possible by the method of working adopted. Assuming that the gob is thrown back into the waste, as the rooms are driven up in the first working, unless particular care is taken in the stowing of this refuse, it will often hinder the extraction of the pillars. If it becomes necessary to move a portion of the refuse, the extraction of the pillars will be made more difficult and much coal will then be lost.

It is this consideration that makes me say that the complete extraction of the coal may often prove the controlling factor in the matter of the disposal of the waste, especially where there is much of that material to handle, which is no doubt the case in the mining of twin seams of coal separated by 30 in. of slate parting, as stated in the second inquiry mentioned.

NEW METHODS NEEDED TO ELIMINATE WASTE

Looking to the future of coal mining and the limitation of our natural resources, in this particular instance, operators view with increasing uneasiness the question of waste in the mining of the coal. While many are loath to leave the old-established methods of mining and adopt another plan than that with which they are acquainted, the fact is becoming more generally realized that other methods of working will often give increased efficiency and eliminate much waste of the coal.

This remark applies particularly to the hesitancy in abandoning the common room-and-pillar method of working and adopting in its place the longwall method.

In that respect, let me suggest that the longwall method of working is far superior to the room-and-pillar method, in reference to securing the complete extraction of the coal where there is much refuse to handle, as appears to be the case in each of the inquiries here mentioned.

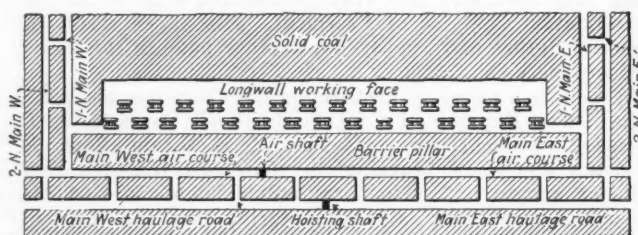
In regard to working the two seams of coal mentioned by the second inquirer, the seams having a thickness of 52 in. and 30 in., respectively, and being separated

by 30 in. of slate parting, I have prepared and beg to submit a diagram giving an outline of the plan I would adopt.

The accompanying figure shows the main entries and air-course driven east and west from the hoisting shaft and the air shaft, respectively. On the right and left of these shafts, two pairs of cross-entries are driven, leaving a pillar of solid coal, 50 or 100 yd. in width, as may be desired or the conditions may permit.

STARTING THE LONGWALL WORKING FACE

Both the main headings and the cross-entries are flanked with barrier pillars of sufficient thickness to protect them from squeeze or creep. The work of opening out a longwall face is now started by driving a cross-heading just behind the barrier pillar left for the protection of the main air-course. The inby rib of



PROPOSED PLAN OF LONGWALL PANEL WORKING

this cross-heading will then form the longwall face, the advancing method being employed in order to give earlier returns on the investment.

All entries should be driven just wide enough to hold up the slate or "middleman," as it is called, and prevent its falling on the roads. If possible, this width should be great enough to avoid the payment of yardage in driving these entries. My plan would be to use a 7-ft. machine for mining the coal, driving hardwood wedges under the coal, behind the cutting machine.

SUPPORTING THE ROOF BY "CHOCKS" OR "NOGS"

For the protection of the men at the working face, I would build a line of "chocks" parallel to the face of the coal and at such a distance from it to permit the passing of the machine. As the work advanced, I would build a second row of chocks between the first row and the face of the coal. These chocks should be staggered in checkerboard form.

When the third cut has been made across the face, it would be time to withdraw the rear row of chocks; but this must not be done all at once. I would follow the plan of having enough material for building an extra chock at the face, before withdrawing the corresponding chock in the rear row. The chock then drawn should be used at the face and placed in position there, before withdrawing a second chock in the rear row. This plan should be followed the entire length of the longwall face.

These chocks or "nogs," as they are sometimes called, should be of hard wood, 8 in. square and 2 ft. 8 in. long, built up in log-cabin style. In order to make the task of withdrawing the chocks easier, the first course should be laid on from 3 to 6 in. of bug dust that can be easily picked out when removing the chock. The distance apart of setting the chocks, center to center, will depend on the conditions of roof and floor and will vary from 3 to 6 yd.

While this method may seem costly at first, it will generally prove a saving of time and money in the end. It also serves to make the men feel that they are safe, which is an important item in the successful operation of a mine, particularly when starting a new method of working unfamiliar to the men.

LONGWALL AFFORDS ROOM FOR STOWING WASTE

In closing, let me say that one of the chief advantages obtained in the adoption of the longwall method of mining is the opportunity afforded for the handling of the waste material, which is the chief concern of the inquirers to whom I have previously referred. All such waste material can be economically used in the building of good packwalls, which take the place of the timber required in the room-and-pillar system of working. With sufficient capital, it is a good plan to push the cross-headings to the boundary and open out the longwall face at that point and extract the coal on the retreating plan.

My experience has taught me that the longwall plan of mining coal, under conditions that favor the method, has the advantage of affording greater safety, efficiency and economy than the room-and-pillar method of working. If mine operators could only assume a perspective view, comparing these two methods of working, in mines that have been operated say ten years, under 500 ft. of cover and normal roof conditions, the result would convince them of the many advantages of the longwall method, which requires less timber, less deadwork, fewer mine fires and a lower cost of production, per ton of coal mined, than is possible by the other method.

Linton, Ind.

W. H. LUXTON.

Can Mine Explosions Be Prevented?

Why a mine becomes dangerous—Investigation of numerous explosions has always revealed some one's mistake—Need of closer supervision—Strict discipline insures safety in the mine.

THE records of the last few months have made the subject of coal-mine explosions one of deep interest. There is a reason for everything and explosions in mines are no exception to the general rule. A person loses his health because of continued disregard of the laws of hygiene. In the same way, a mine becomes dangerous because the management are disregarding of the laws of safety.

Indifference to the little bad practices of mine workers, or the known bad conditions of any portion of the workings in a mine; on the part of the management, breeds contempt for the finer points that make for safety in its operation. According to the laws of probability, disaster will take its toll sooner or later, depending on the extent to which the standards of safety are esteemed and supported by those who are in responsible charge of operations.

A little reflection impresses one that long time has been required to bring man to his present state of

perfection and still the best of us are not exempt from mistakes. Experience proves that the man who has made no mistakes has never accomplished anything worth while.

The logical conclusion of these rambling thoughts is that the occurrence of mine explosions can only be hopefully prevented by more effectually striving for improvement in the management of our mines. Never was there greater need of the closer supervision of underground work than at present.

Reviewing the eleven mine disasters in which I have assisted in the work of rescue and recovery of the mines, I fail to find anything that is particularly mysterious regarding these calamities. In every instance, investigation has shown that some one, through ignorance or willful disregard of the requirements of safety, failed in the performance of his part in making the mine safe and the disaster followed as the result.

More than ever, I am impressed with the thought that our greatest need to prevent waste and destruction is supervision of the highest order. Let me say that an organization of this kind does not come about naturally; it is not self-creative, but must be developed gradually, by close and thoughtful study of all the conditions surrounding the work in and about the mine.

LITTLE REGARD FOR POSSIBLE ACCIDENT

There are many mines that are being operated with little thought of what tomorrow may bring forth. Any suggestion of disaster never enters the mind of the management. If approached on the subject, mine officials console themselves with the thought that they have been operating a long time, on the same scale as that which marks their present undertaking, and have been able to get by without serious accident. Such is their excuse for setting up no new standards, or putting in practice new rules and regulations in place of those at present in force.

Yes, they are aware that a neighboring mine blew up only a short time ago, but say, "We were not surprised for they were surely careless in their methods of operating." As a matter of fact, however, both operations are of the same class and reason suggests that it is only a matter of time when this self-satisfied operator will have a similar experience.

Allow me, here, to refer to another condition that prevails in many mines, but is seldom given much thought. Any one familiar with the inside workings and happenings, in coal mines today, knows that there are many near catastrophes, owing to a blownout shot here, a local explosion of gas there, or a runaway trip in another place. In all of these, it often so happens that conditions are not quite right to make a disaster. We all know, however, that it is good luck and not good management that is keeping many of us from entering the great beyond.

Again, many men working in the mines have a desire to gamble. They take chances and do things that may end in their destruction, simply because it is a little easier or will save a few moments of time. This statement does not apply alone to the ordinary workman, but includes mine officials responsible for the safety of the men in their charge. Nor is it hard to find an instance of this attitude on the part of mining men.

For example, it is well known that substantial concrete or masonry stoppings are absolutely necessary on main flats or entries, in order to insure a properly ventilated mine. In the end, the cost of such stoppings

is doubtless less than the usual makeshift, board stoppings that are so ineffectual in conducting the air forward to the working faces where it is needed. Notwithstanding, however, we find many poorly ventilated mines owing to such worthless stoppings.

DISCIPLINE MAKES A SAFE MINE

By way of illustration, allow me to cite an instance of an operation that was planned to make a safe mine from the first shovelful of dirt thrown out, and has been since and is now operated on the same safe practices. The management have always recognized that safe practices are profitable in every way. From the start, the planning of the mine was carefully executed and adhered to rigidly.

As so often happens, a change of foremen at that time did not mean a change in the plans. All stoppings were built of brick and when the last crosscut holed through, the one behind was closed at once. The foreman or assistant foreman who could not attend to matters of this kind was promptly given a job that better suited his ability.

Gas was reported on the record book and the foreman who countersigned the report made a special report to the management. Standing gas was nowhere allowed

and things went bad with the assistant foreman when a fireboss would report "gas," in the same place twice in succession. The district mine inspector who visited this mine was the real thing—the kind worthy of the name of inspector. Several times I had the pleasure of going over the mine with him, and I fail to recall his ever missing a single working place.

In his inspection of pillars and falls, he always gave special attention to their condition. It was a sad day for the fireboss whose dates were not found at the top of all falls where they were required and showing that the places had been examined that day. Old workings were fenced off and signs posted as a warning to persons to keep out. Every detail of the state law was strictly enforced and no thought was ever given to slight any requirement of the law.

Some managers, I am aware, will argue that miners will not submit to any such rigid discipline. In the mine to which I have referred, however, it was found that the workmen accomplished more with less effort and were better satisfied under the strict discipline that prevailed. I want to say that if all mines could be handled and planned like this one, accidents would be few and disasters far between.

Pikeville, Ky.

GEORGE EDWARDS.

Inquiries Of General Interest

Position of Water Gage When Taking Mine Readings

What Water Gage Reading Represents—Estimating Power on Air from Ventilating Pressure—Power on Air Determines Efficiency of Ventilation

IF IT is not asking too much we would appreciate seeing in *Coal Age* an explanation regarding the correct position of the water gage, as used in mining practice. My desire is to know where it should be placed, in order to give the best results and what the reading of the gage represents. Should the reading be taken in the fan drift, as some claim, or can it be taken at the mouth of the mine? This question is of much interest to us at the present time. MINE MANAGER.

Carlinville, Ill.

In replying to this question, the first point to make clear is the purpose of taking readings with the water gage and know what such reading represents. As has often been explained in these columns, a water-gage reading indicates the difference of pressure acting on the water in the two arms of the gage. In every circulation of air, there are always two pressures acting, the greater serving to produce and the lesser one to resist the movement of the air. The difference between these two pressures, as indicated by the water-gage reading, is the pressure producing the circulation.

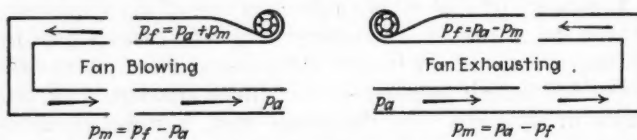
Observe that when the fan is blowing air into the mine the greater pressure is that within the fan drift. This pressure is created by the action of the fan, but caused and measured by the resistance of the shafts

and airways. The lesser pressure is that of the atmosphere at the discharge opening. The difference between these two pressures, or the pressure due to the fan less the atmospheric pressure, is the pressure producing the circulation against the resistance of the mine and the shafts. The reading of the water gage represents the unit of ventilating pressure, or the pressure in pounds per square foot, since each inch of water column corresponds to a pressure of 5.2 lb. per sq.ft.

Multiplying the gage reading, in inches, by 5.2 and that result again by the sectional area of the airway or fan drift, as the case may be, gives the total pressure producing the circulation. This total pressure is equal to the mine resistance and includes the shaft resistances if the reading is taken in the fan drift.

If, however, the reading is taken between the main intake and return airways, on the shaft bottom, the result represents the mine resistance only and does not include the shaft resistances, since the gage reading in that case is the difference between the intake and return pressures.

A water-gage reading taken at any point, in the mine, between an intake and return airway, represents



COMPARISON OF BLOWING AND EXHAUST METHODS

only the resistance of the airways in by from the point where the reading is taken. Thus, a reading taken at the mouth of a split or section of the mine represents only the resistance of that split or section.

On the other hand, it should be clear from the foregoing that when the fan is exhausting air from the mine, the greater pressure is that of the atmosphere acting at the intake opening of the mine or the down-cast shaft, while the lesser pressure is that due to the action of the fan, decreased by the mine resistance or, in other words, the depression created by the fan

in the fan drift. In this case also, the difference of the two pressures, or the atmospheric pressure less the depression produced by the fan is the pressure producing the circulation, as indicated by the water-gage reading.

In mining practice, the purpose of taking the reading of the water gage is to ascertain the actual power on the air, which makes known the degree of efficiency of the ventilating fan, the efficiency being the ratio of the power on the air to the power applied to fan shaft. When the power applied is taken from the engine card, the result includes the combined efficiencies of the fan and engine. In order to eliminate the power absorbed in driving the engine, so as to obtain the efficiency of the fan alone, it is necessary to determine

the brake horsepower of the engine and make allowance for it. The power on the air is found by multiplying the unit of ventilating pressure, which is 5.2 times the water-gage reading in inches, by the quantity of air in circulation (cu.ft. per min.), the result being the foot-pounds per minute, or the power on the air.

The accompanying diagram will assist in making clear the fact that, whether the fan is blowing or exhausting, the mine pressure including that of the shafts is always the difference between the terminal pressures, or the pressures due to the fan and the atmosphere, respectively. Also, when the fan is blowing air into the mine the greater pressure is that due to the fan; while exhausting air from the mine the greater pressure is that of the atmosphere.

Examination Questions Answered

Hoisting Engineers' Examination, Springfield, Ill., Mar. 19, 1923

(Selected Questions)

QUESTION—What are the laws in reference to persons seeking certificates as hoisting engineers?

ANSWER—The Illinois Mining Law (Sec. 2g) requires the applicant for a certificate of competency as hoisting engineer, to be a citizen of the United States, at least 21 years of age and to have had at least two years' experience as fireman or engineer of a hoisting plant. He must be of good repute and temperate habits and pass an examination regarding his experience in the handling of hoisting machinery and his practical and theoretical knowledge of the construction, cleaning and care of steam boilers; care and adjustment of hoisting engines; management of pumps, ropes and winding apparatus; besides proving his knowledge of the laws of Illinois relating to signals and the hoisting and lowering of men in mines.

The requirements of a permit to operate a second-motion engine, at mines employing more than ten men, are similar to the foregoing, but require only one year's experience. The application must be signed by three persons willing to testify to the good reputation and personal habits, knowledge and experience of the applicant. The permit applies only to the mine named in the certificate.

An applicant for a certificate of competency as electrical hoisting engineer must produce evidence similar to that required of a steam hoisting engineer, with the exception that the experience and knowledge of the applicant relates to the construction, care and adjustment of electrical hoisting engines, pumps, ropes and winding apparatus.

QUESTION—What are the duties of the hoisting engineer?

ANSWER—A hoisting engineer should be on hand a sufficient time before taking charge of his engine to enable him to examine carefully its condition and ascertain the need of oiling and adjusting any accessible parts and giving the same the needed attention. After

assuming charge of his engine, the engineer must not leave his post until relieved by another engineer or other competent person. It is a hoisting engineer's duty to know and understand the system of signals in use at the mine and to answer promptly every signal given, never moving the cage except in response to a clearly understood signal. He must use every precaution to avoid accident, in the hoisting of men, taking care not to exceed the speed limit for such hoisting. An engineer must not rely on the accurate working of indicators to determine the position of the cage in the shaft or when hoisting a trip on a slope. He must watch the ropes, which should be so marked as to avoid the danger of overwinding when proper precaution is observed. An engineer must not converse with persons while he has charge of the engine, nor allow persons to loiter in the engine room to detract his attention from the safe operation of the engine.

QUESTION—A pair of hoisting engines has cylinders 30 in. in diameter and a 60-in. stroke. If the steam pressure is 90 lb. per sq.in., how many revolutions per minute must these engines be making when generating 11,000 hp. per hour?

ANSWER—It is wrong to speak of "horsepower per hour," estimating the power developed by an engine or pair of engines. The power developed is expressed in foot-pounds per minute, or foot-pounds per hour, but is continuous at that rate while the engine is in operation. In this case, the sectional area of a 30-in. cylinder is $0.7854 \times 30^2 = 706.86$ sq.in. Assuming a mean effective pressure of 90 lb. per sq.in., the power developed in a single cylinder, during one stroke of the engine (60 in. or 5 ft.) is $90 \times 706.86 \times 5 = 318,087$ lb. A pair of engines generating 11,000 hp. must develop in a single cylinder $(11,000 \times 33,000) \div 2 = 181,500,000$ ft.-lb. per min. Therefore, each cylinder of this engine must make $181,500,000 \div 318,087 = 570$ strokes per minute; or $570 \div 2 = 285$ r.p.m., assuming the given pressure is the mean effective pressure in the cylinder.

QUESTION—Find the horsepower of an engine having two cylinders, 30 in. in diameter and a 5-ft. stroke, when making sixty strokes per minute, with an average steam cylinder pressure of 30 lb. per sq.in., and an average back pressure of 4 lb. per sq.in.

ANSWER—In this case, the net mean effective or average cylinder pressure driving the engine is $30 - 4 = 26$ lb. per sq.in. The total force acting on the piston in a single cylinder is then $26 (0.7854 \times 30^2) = 18,378.36$ lb. The engine making sixty strokes per minute, the piston speed is $5 \times 60 = 300$ ft. per min. At this speed, the power developed in the two cylinders is $2(18,378.36 \times 300) \div 33,000 = 83.538$ hp.



National Coal Association Plans Aggressive Program In Labor and Public Relations

**Resolves in Convention to Follow Officers in Active
Policy to Be Mapped Out by Committee—Salaried Head
to Be Employed Soon—J. C. Brydon Chosen President**

Unity and backbone are the two qualities for which the National Coal Association is now striving. At its sixth annual convention within earshot of the surf at Atlantic City, June 19-22, it made a strong effort to begin another year with a forceful policy to be carried out in a determined way under the direction of an unflinching new president John C. Brydon. Almost everything on the program sounded a warning against a continuance of the selfishness and backbiting between mining fields that has almost always marked operators' affairs. Speaker after speaker did this but to marshal the 400 men present into a solid phalanx ready to back President Brydon in a broad and active policy of relations with labor and the public.

The convention heard the stalwart declarations of both Alfred M. Ogle, retiring president, and Mr. Brydon that the association should hesitate no longer but should take an active hand in dealing with labor. It then elected Mr. Brydon and authorized him to appoint a policy committee of the directors to aid in carrying out whatever program shall become necessary. But many a member, voting with apparent firmness for more definite activities by his officers, went out of the convention wondering just exactly what those definite activities are to be. Mr. Brydon said he will select the policy committee within two weeks.

The convention authorized the directors to employ a full-time salaried president at the urgent suggestion of President Brydon, who, however, is expected to remain at the helm at least until the United States Coal Commission goes out of existence, Sept. 22. Mr. Brydon has had direct contact with the commission for months as chairman of the Bituminous Operators' Special Committee. No names of men fit to succeed Mr. Brydon were suggested but it is generally hoped that an untrammelled individual of highest standing and of deep influence can be found.

The nearest thing to a dispute on the convention floor occurred while a resolution was being adopted favoring the reporting of miners' earnings for 1920 to the Special Committee. Of course, there was opposition by men who pointed out the tremendous expense of furnishing that same data for 1921, but the resolution passed. The report of the Special Committee to the association was considered one of the most essential things on the convention program. A number of operators outside the association but who have contributed to the support of the committee's extensive and expensive work—notably a delegation from Illinois—were present but took no active part in convention events. The

Illinois men heard the report, were informed as to the prospective activity of the association for the coming year and departed to think it over.

The treasurer's report showed the association to be in sound financial condition and with its normal expenses, other than those incurred in connection with the Special Committee's work, reduced. From January to June the grand total expenditures were \$305,000 and receipts \$376,000. Treasurer S. Pemberton Hutchinson's report showed a bank balance on June 16 of \$104,000.

The new officers of the association are: President, John C. Brydon, Somerset, Pa.; Vice-Presidents, Ira Clemens, Pittsburgh, Kan.; E. L. Douglass, Cincinnati; Michael Gallagher, Cleveland; Treasurer, S. Pemberton Hutchinson, Philadelphia; Executive Secretary, H. L. Gandy, Rapid City, S. D.

These directors at large were selected: Frank S. Love, of Pittsburgh, Pa.; Michael Gallagher, of Cleveland; J. B. Pauley, of Chicago (as a member from Indiana); S. Pemberton Hutchinson, of Philadelphia; and E. C. Mahan, of Knoxville. The directors at large were selected upon the recommendation of the nominations committee, which included in its membership Ira Clemens, W. M. Henderson, W. J. Sampson, E. L. Douglass, G. H. Caperton, Hugh Shirkie, T. W. Guthrie and S. L. Yerkes.

In his inaugural address Friday morning near the close of the convention Mr. Brydon minced no words. He is noted for not mincing words. After declaring that officers and directors would be expected to devote time and close attention to association affairs during the coming year he said there should be much closer contact between all fields and all groups because the National must be active, and every man in it must be alive to his responsibilities.

His three suggestions for an active program, were adopted on motion of Phil Penna, of Indiana, amended by T. W. Guthrie of the Hillman Coal & Coke Co. at the close of the address.

The first suggestion was that a policy committee be created to map out activities for the association as the need arises, that the publicity campaign be continued, that the association's bureau of coal economics be expanded so as to collect and complete masses of data on many subjects, and that a study be made to develop methods of getting the best out of employees at a fair daily wage.

His second proposal was that a "minute man" organization of operators be maintained all over the country, trained and ready at anytime to meet emergencies such



as the present situation involving relations with the U. S. Coal Commission.

The third main suggestion was that the presidency be made a full-time, salaried job. He thinks the president should be a broad-gage, capable man unhampered in his association work by any connection with divided or competing coal interests.

Mr. Brydon wound up by frankly speaking of evidences of selfishness and distrust among operator groups during the past year and said such feelings must be forgotten. His address, in more detail, appears in another column.

The convention offered an opportunity for much good fellowship, many plunges in the salt and invigorating waves and for some sober thought.

At its close Mr. Ogle, the retiring president, remarked that probably the most valuable service it had performed was the awakening of the association to a willingness to face facts.

For the first time in the history of the National, an invocation was offered. The Rev. Dr. Elwood, of the Boardwalk Church, followed his prayer with a sparkling, forceful talk on the value of unity.

Harry L. Gandy, executive secretary, who succeeded J. D. A. Morrow last winter after Mr. Morrow had resigned, read an annual report summarizing much of the association's work, pointing out the need of better contact between the operators of various fields.

Then came Gray Silver, Washington representative of the American Farm Bureau Federation, advocating a panacea for all the transportation ills of the coal industry—a type of affliction which he thinks the most serious the industry has to face.

"Encourage hydro-electric development" said Mr. Silver in striking his keynote. "Use the country's coal to generate electricity. Transport current, not coal, and all the worries of car service and motive power and railroad congestion will end." Eight million farm homes are awaiting the time when cheap electricity will be available to them. The market for light and power is almost unlimited. The demand for coal to generate that current will be steady and tremendous. Your mines could produce more coal and sell it at a lower price. Your excess labor would have employment. Strikes would be fewer. There would be less chance for a continuance of misunderstanding between coal men and the public because you would be recognized as the men who help to reduce drudgery and increase happiness in homes."

Mr. Silver solemnly warned the coal men that the great

and powerful farmer in this country has many troubles of his own and the coal men should take care not to add any more, lest the farmer be one of those to rise and force a remedy for the ills of the coal industry. He reminded them that the American government is a government of checks and that it is sure that if an evil that harasses the people is not corrected by those directly concerned, then the people will set up machinery to correct it themselves by government regulation.

"And it is only a step from regulation to nationalization," said he. Mr. Silver strongly urged mutual helpfulness between the coal industry and the farmers, who form, he said, the biggest single group of coal consumers.

The National has learned some things about the art of publicity during the year, C. E. Bockus, chairman of the publicity committee, said in his report. It has learned that in order to get the attention of the people sensational things must be said. And so sensational things are being said through a publicity organization, with the result that information of many types about coal, all aimed to give the public a better understanding of the industry, is getting newspaper and magazine space never before available for the defense of coal. These sensationalisms are not un-

What the Convention Did

- (1) Elected J. C. Brydon, of Somerset, Pa., president.
- (2) Created policy committee to lay out active program along any line that seems worth following. President Brydon to appoint members of this committee soon.
- (3) Authorized officials to set up "minute-man" organization of operators all over the country to be ready for such emergencies as the one raised by U. S. Coal Commission.
- (4) Authorized directors to employ full-time president on salary. Mr. Brydon to withdraw in his favor when he is chosen, possibly after U. S. Coal Commission dissolves.
- (5) Heard bituminous operators' special committee's report.
- (6) Resolved that earnings questionnaire for 1920 will be filled out similar to that for 1921, already supplied to Coal Commission.
- (7) Heard much exhortation to unify and forget selfishness and mutual distrust.
- (8) Plunged daily into Atlantic Ocean.

truths. They are merely facts dressed up in a style which "goes."

Mr. Bockus reported a vast distribution of material to high schools, colleges and centers of public opinion, aimed to combat the movement toward nationalization and government control. He reported that the association's weekly paper, *Coal Review*, is now practically on an earning basis.

The railroad relation committee got the convention to adopt its report opposing the Warfield car-pooling plan which provides for the pooling of railroad cars under Congressional authority. The report was read by C. H. Jenkins of Fairmont, W. Va., in the absence of E. C. Mahan, who is ill.

Vice-President Ira Clemens, of Pittsburg, Kan., took the chair at this juncture. A letter from Senator A. O. Stanley, of Kentucky, who was sorry he could not attend, was read. A cable message from J. G. Bradley, former president of the association, said: "Regret absence. Good luck."

Retiring President Ogle, in his address ending this official service, took no backward step. Instead of closing his year with a few generalities and pleasant words of thanks and commendation to his officers and the association, he declared once more his program laid down at the convention a year ago at Chicago. He wants the association to adopt

an active policy for labor and public relations, each mining district striving to handle its labor affairs in its own way and each advising and co-operating with every other district. He granted it might not be practicable for the machinery for such activity to be worked out in detail by the convention but the directors should be empowered to do it soon.

If a bureau had been at work in the spring of 1922 with wholehearted support from every operators' quarter, directing a definite program, the outcome of the strike might have been different, he declared. Unity would have saved the day. Since then the coal industry has become a political football because public and labor relations were hardly attempted. However, the brief effort at educating the public made during the strike was successful enough to prove that such work should be carried forward on a big scale.

But lack of contact between operator groups and individuals and the more serious fact that efforts of one group often were discredited by others, were criticised most severely by Mr. Ogle. However, he was not for bemoaning spilled milk. He was for profiting by the lessons of the year. He was for the adoption of a method, which he did not describe, for handling the labor, which accounts for 68 per cent of the cost of coal and 98 per cent of coal's trouble. And he was for a concerted, level-best effort by operator's to prevent strikes before some outside force steps in and does some unintelligent thing.

"Protection against such difficulties as those of 1922 is demanded by an irritated public," said he. "How is this to be obtained? That, I believe, is for us to say. An opportunity far beyond anything the industry has ever had before has been put within our hands. The Coal Commission at Washington is today, we are convinced, completely anxious, in fairness and without favor, to help the industry work out its problem. It extends to the industry a helping hand.

"With all possible conviction I want to express the belief that the commission will find as a result of its studies that the surest means of serving the public will call for a minimum of legislation and a maximum of self-determination within the industry. That self-determination must, of course, to be acceptable be exercised with due regard to the interest of all parties concerned, namely the coal-mine owner, the coal-mine manager, the coal-mine worker and the coal consumer."

When Mr. Ogle had finished, the convention rose, en masse, and lustily applauded the retiring president.

The convention was remarkable in that there was no banquet. On Wednesday evening the association replaced that time-honored function with a program of vaudeville and boxing at an athletic club where Atlantic City's prize fighting is held. Both delegates and their ladies listened to the songs and skits and looked on while the meat-faced and "tin" eared athletes did their stuff in four eight-round bouts.

Thursday morning a letter from Dr. Charles W. Eliot, president emeritus of Harvard University and recognized as an authority on industrial economics, was read by Goldthwaite Dorr, of counsel for the Bituminous Operators' Special Committee. Dr. Eliot declared the need is great for order in all coal fields, for public protection against every form of monopoly, whether by labor or capital, for impartial arbitration and for incorporation of labor unions. The letter is printed on another page.

Recognizing Harry N. Taylor, former president of the association in the audience, Mr. Ogle called him to speak. After a few graceful words of appreciation Mr. Taylor declared it is pitiful for an industry to be in such condition that its product is consistently sold below the cost of production, as the product of the coal industry is sold today, according to official reports of the Department of Commerce. In more hearty co-operation, between operators lies the cure, he said.

The report of the Bituminous Operators' Special Committee was then heard. Mr. Brydon, chairman of the committee, read it to a convention of deeply interested delegates. The reading of the report was one of the outstanding events of the convention. Officially it was the report of the government relations committee of the association, but the activities of that large body were principally performed by the

smaller Special Committee, which has been supplying the U. S. Coal Commission with the "broad essential facts" of the industry. The Special Committee is made up of Mr. Brydon, its chairman; Michael Gallagher, T. W. Guthrie, George B. Harrington, F. W. Lukins, R. H. Gross and E. L. Douglass.

The report traced events leading up to the Special Committee's creation and the resignations, for various reasons, of Harry N. Taylor, E. C. Mahan and J. G. Bradley. It recited the activities of counsel in developing facts, proving a case of labor monopoly against the United Mine Workers. In briefs on labor violence it was set forth to the Coal Commission that the unlawful acts of the United Mine Workers were directed not against operation but against the public and that they "afforded striking illustration of the un-American policy endorsed by the miners' union—that no member should be allowed to mine coal in the United States under peril of death." Four of these briefs were filed covering cases in Ohio, in the Consolidation Coal Co.'s properties in northeastern Kentucky, in Herrin and on the abuse of the check-off. Similar briefs on events in Indiana, Utah, Alabama, Colorado and West Virginia are to come.

Cost of living and community life studies have been made, the data to be used later. A brief on margins of profit, pointing out that no standardization of costs and profits is possible in such a competitive industry has been filed.

A special study of transportation is now in progress, local operators' associations have been encouraged to file briefs of their own cases. A large amount of both economic and statistical work has been done by staffs aiding counsel. The field work is about finished but many economic studies are now being made on: (1) Comparison of financial results of bituminous coal operation before 1916 and since; (2) effect of strikes on the price of coal; (3) effect of increasing labor costs on coal prices; (4) comparison of pay in coal and other industries; (5) profit sharing in England and English wage-regulating methods; (6) attempts that have been made to base wages on changes in the cost of living; (8) working rules imposed on men by United Mine Workers. A large legal, field, statistical and clerical force is used for all this work.

It is costing operators between \$5,000,000 and \$10,000,000 to answer the commission's questionnaire forms C-1 and L-1, the report estimates.

After speaking of the various questionnaires it had sent out the government relations committee remarked that lack of cohesion in the industry was a serious obstacle it had to meet. It urged "various interests of the bituminous coal industry to free their minds of suspicion each for the other and to meet each other in a spirit of friendliness, confidence and tolerance."

The committee said it at first refrained from public propaganda but after the miners had violated their promise not to propagandize, the committee was released by the Coal Commission to do likewise. So a department of public information was organized and is serving out coal publicity to all sorts of papers and magazines.

To pay the bills of all this activity an assessment of four mills per ton was levied against association members Oct. 11, 1922, for three months and repeated April 11, 1923. No further assessment is expected during the life of the Coal Commission, which ends Sept. 22, 1923.

Following this report a resolution of sorrow at the death of John J. Tierney was adopted.

Then Colonel Henry L. Stimson, of counsel for the Special Committee, spoke for 20 minutes, forcefully advising unity. He said the experience with the Coal Commission has taught operators the value of a united industry viewpoint and shown the necessity for constructive leadership in the industry. The wide divergence between union and non-union fields observed at first have turned out to be merely differences of detail, he said, advising that all the main differences be now wiped out so that the industry can correct its own ills rather than suffer the correction from without.

Three sorts of labor relations are now operative in the mines, he said. They are unionism, non-unionism and direct dealing of operator with his own men. The latter is not common, but its success, he declared, is marked. However,

no two of them should be abolished in favor of the third. That would mean industrial war. Tolerance of the other fellow's idea of proper relations is essential. Impartial arbitration is the best preventive of industrial warfare. That's the only way the people can learn the facts of a controversy. However, it is vital to operators that they unite, show their strength and stand on their legal rights, else they will have no legal rights.

Colonel Stimson warned that the troubles of the industry won't end Sept. 22, when the U. S. Coal Commission goes out of office, and operators should take a long look ahead.

A little verbal passage at arms accompanied by a faint odor of brimstone followed the appeal of Mr. Dorr, of counsel, that operators fill out from 1920 an earnings questionnaire similar to that filled out for 1921. But the decision was finally in favor of the members filling it out.

Mr. Dorr said the Coal Commission asked for 1921 earnings because that was the most recent full year previous to the strike. But being a year of depression, the figures are not showing the commission a true picture. Earnings per man are going to appear low.

Several men at once pointed out the tremendous trouble and cost of getting out such a report for 1920. Included was Charles F. Richardson, of western Kentucky. But the association leaders were for it. T. W. Guthrie pledged himself to do all in his power to get all the operators in his region of Somerset County, Pennsylvania, to supply the data. Tom W. Lewis argued for the 1920 figures. President-elect Brydon said 1920 data are essential in order that nothing may be left to commission conjecture. It was finally decided to send out a circular letter to get the 1920 information, with the hope that the response would be a lot better than the 30 per cent average response to previous questionnaires of the Special Committee.

Governor Morgan of West Virginia was invited to speak at the opening of the final day's session. He paid his respects to the many investigators who have misrepresented conditions in his state and hoped the U. S. Coal Commission would do something constructive.

A rising vote of thanks was given W. H. Cunningham and his committee on convention arrangements. The reluctant Walter was dragged into the spotlight by his loving friends, whereupon he delivered himself of the following lengthy oratorical gem: "Mister President, I'm a man of few words and not many of them. I thank you."

"A good speech," commented Ogle from the chair.

Bolshevism appeared as a real and immediate menace to America and to the coal industry during the next 45 minutes of the convention. Colonel Guy D. Goff, former general counsel to the Shipping Board and until recently assistant attorney general, made such an able case against "The Poison in a Democracy" that many a man present got a new vision of what is going on in the one-third of the world now under Red control and of the Red activities to gain the upper hand in this country.

Following Colonel Goff's address, which won an intent hearing and hearty applause, the new board of directors organized, President-elect Brydon made his address and the

resolutions of the convention were adopted. Routine resolutions ratified the activities of the retiring officers, and directors, especially Retiring-President Ogle, expressed appreciation of the work done by the Bituminous Operators' Special Committee, did the usual courtesies to those who had to do with the convention, thanked the visiting speakers and changed the by-laws in a few unimportant details, one of which added an extra directorate to be filled when a paid, full-time president shall have been employed.

The final resolution provided that "the board of directors may provide for compensation to the president if the president devotes his full time to that office" and may elect from outside their number, a paid vice-president.

Directors elected by state groups and announced by the committee on nominations were as follows: Maryland, G. Marshall, Gillette; Pennsylvania, John C. Brydon and Edward Soppitt; West Virginia, C. H. Jenkins and C. C. Dickinson; northeastern Kentucky, E. L. Douglass; Missouri, F. W. Lukins; Tennessee and Georgia, L. C. Crewe; Utah and southern Wyoming, Moroni Heiner; Michigan, R. M. Randall; Ohio, S. H. Robbins, Tri-State Coal Stripping Association, W. J. Sampson.

The appointment of the following new members to the Bituminous Operators' Special Committee, which is co-operating with the U. S. Coal Commission in its investigation of the soft-coal industry, was announced on June 25, by Chairman John C. Brydon: A. M. Ogle, of Terre Haute, Ind., retiring president of the National Coal Association, and S. L.

Yerkes, vice-president of the Grider Coal Sales Agency, of Birmingham, Ala., and director of the National Coal Association.

"Both Mr. Ogle and Mr. Yerkes have been invaluable in an advisory capacity since the formation of the special committee," Chairman Brydon declared. "I am gratified that circumstances have made it possible for Mr. Ogle and Mr. Yerkes to see their way clear to accept appointment to the two vacancies created some time ago and to become active special committee members. Their acceptance completes the membership of the committee, which is now composed of nine members who represent the bituminous industry well geographically.

"The work of the Special Committee is now approaching its most important period. The field work and the assembling of statistical data from the various fields within the thirty coal-producing states is virtually completed.

"It now remains to compile the facts and data which have been collected and to present them to the Coal Commission, working out from those facts suggestions and policies of how the bituminous industry can best serve the public and insure at all times a steady flow of good quality coal to the consumer at fair prices."

The complete membership of the Special Committee follows: John C. Brydon, chairman, of Somerset, Pa.; R. H. Gross, of Boston; E. L. Douglass, of Cincinnati; Michael Gallagher, of Cleveland; Tracy W. Guthrie, of Pittsburgh; George B. Harrington, of Chicago; F. W. Lukins, of Kansas City; A. M. Ogle, of Terre Haute; S. L. Yerkes, of Birmingham.



JOHN C. BRYDON

Newly Elected President of the National Coal Association

President Brydon Makes Three Proposals in Speech Of Acceptance to National Coal Association

The speech of acceptance of John C. Brydon after his election as president of the National Coal Association at the Atlantic City convention June 22, in which he proposed a policy committee to lay out an active program for the association, that a "minute-man" organization of operators be built up and that the association presiding be made a full-time salaried job, follows:

"For some months I have been serving you in the capacity of chairman of the Bituminous Operators' Special Committee. You have now elected me to the highest office within your power. In accepting that office I do so with profound appreciation of the confidence which you, by your votes, have expressed and also, I must add, with a very deep and definite realization of the responsibilities which you have placed upon me.

"The National Coal Association, created in order to unite the coal industry into a harmonious whole for helping our country win the war, is like our country in its form of organization. It is a federated body composed of distinct and separate members, each with its own local organization for dealing, in its own way, with its own local problems; but all joined together in the work of advancing the good of the entire industry.

"The history of the year just closed makes it clearly evident that our association must deal with national problems, and so, in certain broad and fundamental matters, must act for the great body of its members. No single group should, nor can, direct its policy. This policy must be national in its scope. Individual ideas regarding fundamental matters, when opposed to a majority idea in the interest of the general good, should be submerged. In matters which affect the industry as a whole, the minority should willingly subject themselves to the settled experience and convictions of the majority.

"In attempting to act for this majority, however, it is often difficult to determine what this majority's attitude is on a given question in time to take the right step at the most effective moment. The causes of this are two in number: (1) An insufficient acquaintance on the part of the national officers with the general thought of the industry, due, often, to their inability to enjoy proper frequent personal contact with the component parts of the organization; and (2) The general apathy and indifference of the various component and more or less scattered units, as to the problems of their neighbors and associates in the industry. Sometimes these local groups appear to take only a passing interest even in their own affairs.

ACCEPTANCE OF OFFICE CARRIES RESPONSIBILITIES

"To accept an office in the national body, is to accept very genuine responsibilities. It demands from an official his most careful thought and consideration. This applies not only to the national president, vice-presidents, secretary and others in the national headquarters; it applies equally to every single director on the National Coal Association's board. Too often the duties of your directors are held lightly; too often your directors are absent from meetings. This should not and must not longer be allowed to continue.

"It is not only incumbent upon the directors to consider their responsibilities to their constituents; it is equally incumbent upon the membership of this association to see that they do. Furthermore, when the directors give their best it is up to the entire membership to assist them with its fullest co-operation. Unless we can have a board of directors who will at all times have the responsibilities of their office uppermost in their minds in the service of a body of members which is informed, alert and sympathetic, we cannot act properly on any matter of interest to the Association.

"Secretaries of local associations are oftentimes the only ones who have the time or opportunity to give their undivided thought and attention to the general conditions and

needs of their districts. They are often the only contact point between one district and another. With these local secretaries the National officers should at all times aim to keep in close personal contact. In every possible way they should be helped to build up solid, substantial, successful organizations. Their interest should be ours; ours should be theirs. Hurt to one of us is harm to all.

"In order to promote this purpose more actively, it is proposed that frequent contacts be made not only with the secretaries but with the operators in the various districts by means of visits by the National officers to the local associations and by conferences of local secretaries and officials. In addition to such contacts in the field, the headquarters at Washington must at all times be kept available for the benefit and help of the local operators and secretaries. For that purpose there soon will be provided rooms in the National offices which will be considered the headquarters of any operators or secretaries who may be visiting the national capital. In these rooms will be found every possible facility for their work while in Washington. But, gentlemen, I submit that after this past year's experience, we ought to plan for still other ways to help each other and our industry.

POLICY OF "ENCOURAGEMENT" LACKING

"The third clause of the National Coal Association's certificate of incorporation says that the object of the organization is to 'the encouragement and fostering of the general welfare of the bituminous coal-mining industry of the United States.' But up to the present time the National Coal Association has had no positive, well-defined policy for carrying out this object. In spite of that, as we have seen, our organization has been officially recognized by government officials as the legitimate—and practically the sole—representative and spokesman for the entire bituminous-coal industry. The responsibility which this recognition represents came to us as the result of a great emergency in which both the country and the industry found themselves.

"Gentlemen, I submit to you that the meaning of all this is plain and unmistakable. It means that we must no longer allow our association to be the mere creature of such emergencies as may chance to come upon us. We must organize in advance of their arrival; we must try to *keep them from arriving!* It is no longer for us to choose whether we will speak authoritatively for our industry or not. Fate has made that decision for us. Fate, you might say, has forced us to comply without articles of incorporation! It has made us get under the responsibility which we then saw only dimly, but which we now see plainly.

"All this means that the time has now come when, as an 'association for the encouragement and fostering of the general welfare of the bituminous coal-mining industry in the United States,' we must outline a more definite, more positive, more aggressive policy of organization and action. I therefore recommend that there be added to the standing committees of the association a 'policy committee,' which shall proceed to consider and formulate the steps which should be taken. In the past the tendency of the coal operators has been to sit back and admire themselves for their probity and honesty of purpose, failing meanwhile to tell the public either what they were doing or why they were doing it.

"All of us now recognize the gratifying results recently obtained by the Bituminous Operators' Special Committee through their bureau of public information in the correction of such an unorganized and unsatisfactory situation. The public has long been misled, but it is now beginning to learn the truth. I submit that what this committee has started, the association, with the approval of its 'policy committee,' should perpetuate in the interest of our industry. We must stand ready and willing at all times to keep the public informed of the true situation in the field of bituminous coal.

We must organize to put ourselves regularly and continuously into closer contact with the public's interest and the public's mind. If we do this and if the 'policy committee' and the directors keep us doing new and worthwhile things for the improvement of our industry, every editor in the country will be glad to publish the facts. That is all we ask.

"Our bureau of coal economics has for some time been obtaining statistical information on certain subjects of decided value to the industry. The Bituminous Operators' Special Committee has learned in the course of its relations with the commission and the public that this statistical material has not covered enough of the facts to meet the needs which we now see are certain to arise. I believe that this bureau should become part of a larger department which would aim to have at all times on hand or easily available the full information, statistical or otherwise, relating to any specific matter likely to be of use either to our members or to the public's better understanding of the aim and the activities of those members.

"Such a department or bureau would help us all to do our work better. It would provide a central meeting point for discussing and exchanging experience and information concerning the biggest problems or the best practices throughout the length and breadth of the soft-coal fields of America. How can an operator get the best out of his mine, the best out of his machinery, the best out of his materials? For all such information our organization should, in ways to be recommended to the executive committee by the policy committee, make itself the clearing house—the point of central collection, digestion and dissemination. In my opinion also we should not fail to include in such information the study of the greatest problem of all—how to get the best out of our men, how to secure the utmost of an efficient, willing day's work in return for a proper day's wages. Recent experience has shown that the association may, with propriety—and, in fact, for the holding of the confidence of the public, *must*—arrange to give this matter of securing the best from our workers the thought and attention which represents the attitude of the industry as a whole.

"Only in these ways can we make sure that the association is properly fulfilling its obligations to the operators and the entire personnel of the industry and to the public. In connection with the last named I wish to make a proposal in line with the further extension of the kind of service which we have been able to perform for the government since our organization in 1917.

"It was my misfortune—or good fortune, as the case may be—to be a part of the U. S. Fuel Administration throughout all of its life and so to have a chance to observe its activities. It will be recalled by all of you that at first the practice was to exclude from this work all those who had at that time any connection whatever with the industry which they were asked to help direct. The disastrous results of this practice are inevitable; in this particular instance no semblance of order was brought about until the U. S. Fuel Administrator called to his aid the practical coal men of the country.

"Now, in view of this distressing experience, I wish to propose that this national body, here assembled, take occasion at this time to offer to the government the expert knowledge of its membership in the production and the distribution of soft coal. The acceptance of this offer would mean that, in co-operation with the proper governmental and transportation officials, we would work out in advance a nationwide plan which, in the event of any national emergency, would instantly place at the disposal of the government the nation's entire resources of soft coal, ready for efficient distribution and use.

"This plan of coal mobilization could be so comprehensive that it would apply not only to the central organization at government headquarters but even to the remotest coal-producing district in the whole United States. Its details should so definitely specify the personnel that the moment an emergency arose, every man would proceed instantly to his prearranged post, and at once begin to function for the protection of the nation's life.

"One more proposal and I am done. My experience as chairman of your Special Committee has taught me another basic fundamental truth which I want to lay before you for your most serious consideration. It is this. I believe that

no man can serve this huge, vital and widely scattered industry in the capacity of its chief executive unless he is free to give it his entire attention—unless, he is a full-time man. There are many reasons for this. I will mention only one.

"Now that our association has come to represent the soft-coal industry throughout the nation, its chief executive cannot fulfill his obligations unless he thinks of the industry in terms of the whole industry, without prejudice for or against any group and regardless of his own individual interests. With our organization playing such a part in the life of the country it is manifestly unfair, either to the association or its chief, to place any man in this position of divided and competing interest.

"I recommend, therefore, to your most earnest thought and action a full-time man to be the executive head of this organization. I say to you further and in all sincerity and earnestness that in my opinion this selection should not be delayed. I shall willingly and gladly pass over to him all those responsibilities which you have thought proper to put upon me the moment such a man is found. I recommend that this convention here and now proceed to set in motion the machinery which will enable the directors to take the step I believe is proper and for the best interests of the association and the industry.

"In this as in all things, there must be confidence expressed by each of you for the other, and there must be a ready response of each for the good of all. Selfishness and distrust must be forgotten. Confidence and willingness to serve must take their place. Without this we cannot be of use to each other inside the industry, nor to our fellow citizens outside. With this we can hope to face the year ahead of us in full belief and confidence that our industry and our organization will meet and make the most of such great possibilities of nationwide service and nationwide recognition as we have never hitherto been bold enough to dream of."

Dr. Eliot Says Miners Union Should Incorporate If Peace Is to Be Had

Incorporation of unions, arbitration as a means of teaching coal facts to the public and the abolition of every form of monopoly either by labor or capital were advanced as necessary to peace in the coal industry by Dr. Charles W. Eliot, president emeritus of Harvard, in a letter written to the National Coal Association in convention June 19-22 in Atlantic City, N. J. Said he in his message:

"That part of the American people which thinks about the existing industrial warfare from the consumers' point of view and with a forward look to the general welfare is hoping that the U. S. Coal Commission will see its way to make recommendations on the following subjects:

"(1) The keeping of order in all the coal fields of the country, unionized, non-unionized, and those managed by direct negotiation between the employer and his employees, to the end that the country's supply of coal may be fully maintained, while indispensable improvements in industrial relations in the coal industry are being devised and brought into use.

"(2) The protection of the public against every form of monopoly in the coal industry, whether attempted by labor or by capital. The American people have already shown by their votes, their voluntary actions in emergencies, and through the press, that hereafter they will not have the supply of coal to the factories, households, and carriers of the country abridged, much less stopped, by any monopolistic control whatever. The reaction of the public all over the country to the police strike in Boston was instructive on this matter.

"(3) The high value toward the prevention and settlement of industrial disputes of face to face discussion between the parties before an impartial arbitrator whose decision is effectively published. It is not essential that the arbitrator should have power to enforce his decision on the disputants. It is enough that public opinion is informed through him about the nature of the dispute and the motives of the disputants. A striking illustration of the value of such published discussions occurred last year in Canada,

which has now enjoyed for many years its excellent Industrial Disputes Investigation Act. In that year not a single working hour was lost through industrial disputes of any of the railways or in any of the railway shops of the Dominion. In the same period strikes among railroad employees caused heavy losses to railroad labor and capital in the United States, caused many distresses and much loss of valuable time to the American public at large.

"(4) The incorporation of all unions which relate to the coal industry and the industries that distribute coal. In the public interest it is inexpedient that these secret societies, which collect large sums of money from their members, and use all their resources to support strikes however violent, should continue to be exempt from the usual legal processes to prevent violations of contract and enforce payment of damages. The steady resistance of all unions to incorporation should have revealed to the American public long ago the illegitimacy and dangers in a republic of their policies and aims. They possess great power, but claim exemption from responsibility for the use of that power.

"(5) The creation of industrial commissions for numerous districts or localities within which peculiar but recognizable local conditions exist, commissions with powers of public investigation and recommendation in industrial disputes. The idea of uniformity in wages, hours, conditions of work and mode of life among workmen in city and country, in cold climates and hot, in lowlands and highlands, in industries that must be continuous and in those that need not be, and in highly seasonable employments and those that are not, may fairly be said to be completely unreasonable. In practice it has proved to be pernicious. Hence the need of local or regional industrial commissions.

"(6) The inculcation among the classes or groups that

carry on the industrial war of the doctrine that within the past 150 years science, art, popular education and politics have achieved so much progress as to make now possible the substitution of conference, discussion, conciliation and arbitration as means of securing human rights, for the former inevitable method as destroying property and killing or wounding adversaries.

"(7) The development of the partnership relation between the employer and his employees, as distinguished from the landlord and tenant or the master and servant relation. This partnership idea does not exclude from a mill, shop or factory methods which imply subordination, discipline, punctuality and systematic co-ordination. Far from it; but the discipline and co-ordination must be co-operative. It does exclude the sharing of losses as well as gains by all the industrial partners, because the 'hands' in most industries are not in position to meet losses of capital in the business from which they earn their livelihood. If thrifty, they are acquiring capital, but as yet have acquired but little.

"(8) The abandonment by all concerned of the policy of reducing individual, group or a community productivity as a means of promoting individual, group or community welfare and national prosperity. The success of democratic institutions depends, in the long run, on every citizen's doing his best for the common welfare. Slackers and malingerers belong in a society based on slavery, not in a society of freemen. The progress of democracy depends on the successful development in all sorts and conditions of men of personal initiative, interest in the work that yields the livelihood, joy in work loved and ambition to excel in it. Every successful industry is characterized by increased production, not by diminished. Every effective and happy human being yields a similar result."

Southwest Operators Recite Difficulties of Producing Coal in That Field

The Southwest Interstate Coal Operators' Association, representing the soft-coal industry in Missouri, Kansas, Arkansas and part of Oklahoma, reported to the U. S. Coal Commission on June 2, 1923, that oil is driving the production of their mines out of the market and the coal industry in this section is facing ruin. The mine workers are accused of interfering with operations, restricting output and otherwise making it impossible for the operators to compete with oil and with coal from other fields.

The report sets forth that "the policy and practices of the United Mine Workers of America have become insuperable obstacles to the efficient and regular production of coal in the Southwest. This policy has involved wholesale violations of contract, interference with the legitimate functions of management, maintenance of an exorbitantly high wage scale, resistance to the introduction of labor-saving machinery and safety devices, and the use of intimidation and violence to prevent any operator or worker from mining coal except under the domination of this labor monopoly."

The right to hire or discharge men, vested in the management, according to a contract with the union, has been consistently violated, according to the statement, which says:

"The utter inability of the operator, on account of interference by the United Mine Workers of America to exercise free and untrammelled management from the viewpoint of economy, good judgment, or scientific mining, has increased the cost of production at least 25 per cent in this territory."

The operators' report gave the following as some of the examples of this interference:

Refusal to allow miners to work at more than one job during an eight-hour day, thus requiring the employment of additional men to do work that could be done by one.

Dictation by union committees, which prevents miners obeying instructions of the mine foreman.

Passage of resolutions and arrogant rules by local unions, interfering with the right of management and the right to hire and discharge.

Strikes over petty disputes, which should have been settled by arbitration under the agreement, causing the

shutdown of mines, and constant strikes over questions of time and pay which were provided for in the agreement.

Particular stress is laid by the operators on the hostility of the mine workers to the introduction of undercutting machines. The report further states that the rank and file of the United Mines Workers in the Southwest recognized the conditions facing the operators and are willing to give proper consideration to a readjustment in wage scales to meet these economic conditions "but are prohibited from doing so by the system of making and enforcing a national basic wage scale such as was negotiated in the last conference in New York by two and one-half states, under the name of a tri-state conference, representing a trifling per cent of the tonnage for the entire industry of the United States, and a tonnage which is not affected by oil and gas competition to any appreciable extent."

J. C. Brydon 33 Years in Coal Industry

John C. Brydon, newly elected president of the National Coal Association, was born in Bloomington, Garrett County, Md., in 1871, and began his business career in 1890, when he became mining engineer for the Davis Coal & Coke Co., one of the Davis and Elkins interests in West Virginia. He went up through the ranks to the position of general manager, which position he resigned in 1902. In that year he became general manager of the Somerset Coal Co., at Somerset, Pa., which was one of the first moves of the C. W. Watson interests into Pennsylvania representing a combination of a large number of individual operations in Somerset County, and which later became a part of the Consolidation Coal Co. Later he also took charge of the Maryland Division of what is now the Consolidation Coal Co. In 1906 he resigned to become president of the West Kentucky Coal Co., one of the subsidiaries of the North American Company, with headquarters in New York.

Resigning all salary connections with those interests, he went into business for himself in Somerset County, and organized the Quemahoning Creek Coal Co. and the Listie Coal Co. He is president of both of those companies, which operate four mines in two counties. He also is president of the Maryland Big Vein Coal Co., which he organized more recently. He is a stockholder in several West Virginia companies.

Letter by Wadleigh and Address by Parker Feature Coal Retailers' Convention at Scranton

Coal dealers from all over the country comprising the membership of the National Retail Coal Merchants' Association, gathered at Scranton on Monday, June 25, for a three-day session in their sixth annual convention. Association business and reports of committees occupied the morning sessions on Monday and Tuesday while Wednesday was devoted to a trip to the mines.

F. R. Wadleigh, Federal Fuel Distributor, who had been invited to speak before the convention, was unable to attend but wrote the following letter to Roderick Stevens, chairman of the Board, in which he explained to the retail coal dealers his purpose in making a study of community coal storage. The work was undertaken at the request of the Secretary of Commerce, Mr. Wadleigh says, "for the purpose of obtaining all facts and possibilities pertaining to the subject in general and to certain selected communities in particular.

"As there seems to have been considerable misunderstanding of the purpose in making this study, I desire to emphasize what I have previously endeavored to make clear by correspondence and conversation; namely, that the proposed study does not necessarily involve governmental ownership or operation, but is solely an effort to obtain all information bearing on the subject, together with its possibilities, so that we may know definitely whether it is worth developing, for the public benefit.

"In order to have the advice and co-operation of some of the leaders of the coal industry, I appointed an Advisory Committee of coal operators. The committee has had no meetings, the matter having been handled entirely by correspondence, as it was desired to take up, as little as possible, the time of the individual members.

"To make the necessary field investigations, I secured the services of E. A. Blake, until recently general superintendent, Eastern Division of the Norfolk & Western Ry. Co., Roanoke, Va., and of Geo. S. Pope, engineer in charge of the Government Fuel Yards, Washington, D. C. Mr. Blake is a railroad man of wide experience on coal-carrying railroads and is thoroughly familiar with all problems of rail transportation of coal. Mr. Pope, in addition to being an engineer by training and experience, especially familiar with coal, has been in charge of the Government Fuel Yards at Washington since they were first put in operation.

"The places selected for a study of community coal storage were Chicago, Ill.; Detroit, Mich.; Buffalo, N. Y.; Minneapolis and St. Paul, Minn.; Worcester and Lowell, Mass.; Indianapolis, Ind., and Cleveland, Ohio.

"All of these cities were visited by Messrs. Pope and Blake and conditions at each carefully studied, with the assistance of local authorities, commercial and engineering bodies and the leading coal merchants. The field studies have now been completed and Messrs. Pope and Blake are preparing their final report, which will be sent to the advisory committee for their views and recommendations, after which the report will be placed at the disposal of the U. S. Coal Commission for use as a portion of their final report.

Discussing publicity and advertising for the coal industry, Mr. Wadleigh pointed out the prominence given to the coal question by the evidence of the past spring and winter, which, he said, "have advertised the industry to a much greater extent than had ever occurred before and have brought its problems actively before Congress and the public, no doubt to the ultimate good of the country and of the industry. One definite need of the industry in the past and today is a comprehensive scheme of co-operative publicity along lines that will increase the economical use of coal generally.

E. W. Parker, director of the Anthracite Bureau of Information, speaking on "Mining and Preparation of Anthracite" the second day of the convention, told the delegates that estimates of the life of the anthracite region at

the present rate of production vary from 60 to 100 years.

"Two things are certain," he said. "One is that the peak of production has been reached, while the population of the anthracite-consuming territory is continuing to increase, which does not tend to lessen the demand. The other is that not many more years—a few decades at most—will elapse before the inevitable period of decline must begin. We are already face to face with the proposition that anthracite is becoming from year to year more and more a luxury fuel.

"There has never been a time in the history of the region," he added, "when more care and expense have been exercised in the preparation of anthracite than at the present time. I am speaking now of the responsible anthracite operators, not of the pirates who have seized upon the necessities of the public during the past winter to ship out as coal stuff shoveled into railroad cars from the old waste dumps. These sharks always get their money in advance for stuff that is absolutely worthless, or nearly so. A few years at the state rock pile is little enough for them, and I for one sincerely hope that they will be brought to book for the frauds they have practiced upon the dealers and the public."

Mr. Parker said that the members of the U. S. Coal Commission, during their recent visit to the anthracite region, were impressed with the fact that the engineering practice was all that could be desired and is far ahead of that in the bituminous fields. He said that Chairman Hammond is credited with the statement that anthracite is being produced as economically as efficient management and engineering practice can accomplish.

Labor cost rose from \$1.60 per ton in 1913 to \$4.05 in 1921. Engineers are busily at work devising means of burning bituminous coal without smoke for domestic use. Coke is becoming more and more of a menace to the anthracite trade, and the fuel-oil people are "as busy as dogs killing snakes" in their efforts to break into the domestic heating trade. He said it is a safe guess that the average net return for the anthracite sold in 1921 was not more than 35c. per ton, and as the average investment in an anthracite property at the present time represents about \$8 to \$8.50 per ton of annual output, this indicates an actual profit of barely 4 per cent on the investment. If production is to be restricted by the competition of other fuels, the cost must necessarily increase.

The news of the convention will be given in *Coal Age* next week.

Mine Workers Would Outlaw Members Who Join "Red" Organizations

The International executive board of the United Mine Workers of America, in session in the international headquarters of the organization at Indianapolis, June 21, issued instructions to all district officials to institute proceedings at once to place on trial any members who are affiliated with any of the movements seeking to undermine the strength of the union or affiliated with any of the "red" organizations.

The statement in which the instructions were embodied was issued after the board had considered a report presented by a subcommittee, which describes in detail the plans of the Nova Scotia district of the organization to affiliate with the Red International of Moscow, Russia.

It also denounces the "progressive international committee of the United Mine Workers of America," which is reported to be headed by Alexander Howat, a Kansan who has been attempting to overthrow the present régime in control of the United Mine Workers for years; William Z. Foster, Thomas Myerscough and Thomas Ray, all of the Pennsylvania district, as an organization which is attempting to gain control of the United Mine Workers' organization with the intention of overthrowing it.

Assigned-Car Practice Overthrown

The railroad practice of giving a preferential car supply to those mines which furnish railroad fuel was overthrown on June 27 by a formal opinion handed down by the Interstate Commerce Commission.

In summarizing this opinion the commission said: "The practice of the respondent in assigning private cars on systems or foreign-line cars for railroad fuel to bituminous-coal mines in excess of the ratable share contemporaneously distributed to bituminous-coal mines upon their lines which do not receive assigned cars is found for the future to be unjust and unreasonable and unduly and unreasonably prejudicial to mines not receiving assigned cars in favor of mines which are furnished such cars in excess of ratable proportions. Cars specially placed by order of the commission under provisions of paragraph 15 of Section 1 of the act may properly be treated as assigned cars and these need not be taken into account in determining the ratable distribution when order of placement so requires."

This constitutes an express victory for the National Coal Association, which took the lead in challenging this practice of the railroads. The association received important help from the United Mine Workers of America.

I. C. C. Bans Virginian Ry. Extension; Too Many Mines Now, It Holds

Because the Virginian Ry. has more coal mines on its roads than it can serve efficiently the Interstate Commerce Commission on June 25 refused that road permission to construct an extension of its lines in Wyoming County, West Virginia to serve mines being opened by the Pocahontas Fuel Co. This is considered to be the first decision of the commission under the new powers conferred by the Transportation Act to limit railroad extension for reasons other than financial.

The contention was made by the commission, it is said, that fewer mines would produce more coal, because rail equipment and facilities could be better concentrated. Another point was that during the last year there were twenty-eight weeks in which the Virginian Ry. was unable to supply more than 50 per cent of the cars needed by the mines in existence.

Work had already been started by the Virginian Ry. on the proposed branch, which was extended along the Guyandot River Valley.

No formal announcement was made by the commission besides the fact that the application had been denied, but it was indicated that the commission would, within a few days, make a full report, giving detailed reasons for its action.

The Pocahontas Fuel Co. has a 5,000-acre tract on the Guyandot River now developed by two mines on the south side. The extension asked for by the Virginian is less than half a mile in length, to cross the river and permit the opening of coal on the north side thus allowing the complete and proper development of the whole tract. There is nothing to prevent the coal company from doing at its own expense that which the Interstate Commerce Commission prohibits the railroad from doing.

President Says Coal Commission Will Bring New Understanding of Fuel Problem

President Harding told an audience at Cheyenne, Wyo., on June 25, on his trip across the country, that he is opposed to nationalizing the coal mines. "That," he declared, "would only be another step to the national paralysis which a sane America will everlastingly avoid."

Referring to the forthcoming report of the U. S. Coal Commission, the President said: "It is too early to say whether the commission will suggest plans of permanent cure which the Congress will adopt. I do know that it will bring us to a new understanding of a problem which must be solved. We shall have a publicity which will make greed impossible and point the way to solve a question which must be answered in behalf of a vital public interest."

"Meanwhile, we shall better guard against inconvenience

and hardship if the consuming public will help as best it can, without expecting the government to assume all the responsibility.

"If the coal-consuming world would buy coal during the periods of scant consumption it would guard itself against price panics and dangerous shortages when consumption is at the peak. In the hope of lower prices, the buying is postponed and that very postponement is contributing to a decided price increase. There is need for some individual initiative and responsibility in preparing for the wintry days to come. There is a mistaken notion that somehow the government may wield a magic wand or strike with the iron hand, and produce cheap coal. It can do neither.

"Many mine operators, who were as much responsible for the strike as the workmen who struck, insisted that under law enforcement they could produce all the coal that was needed. The law enforcement was provided but no coal was produced."

Federal Trade Hearing on Charges Against Dock Association Drags Along

The hearing on the charges by the Federal Trade Commission against the Northwest Coal Dock Operators' Association is still under way in St. Paul. The evidence offered by the commission for the first week or more was largely documentary, consisting of letters and circulars issued by the dock association in the past, minutes and records, which are assumed by the prosecution to establish the charges made of price fixing, collusion, credit information, and steps toward monopolizing the coal business of the district.

Among the witnesses were: W. H. Groverman, for years secretary of the Northwest Coal Dock Operators' Association, who was asked to identify numerous letters and other documents; and a number of other well-known coal men.

Anthracite Miners Convene at Scranton to Prepare Wage Demands for Coming Year

Anthracite mine workers met at Scranton on Tuesday, June 26, to consider the demands they will present to the operators in the negotiations for a wage scale to replace the present one, which expires on Aug. 31 next.

Interest lies chiefly in whether the miners will renew their 1922 demands for a 20-per cent wage increase or will concentrate their effort on obtaining the check-off, which also was demanded last year. Some of the union leaders were of the opinion, it is reported, that most of the 1922 demands, none of which was obtained after a five months' strike, would be renewed. It is expected that negotiations will be opened by the miners with the operators immediately after July 4, when with the miners' demands and the report of the Coal Commission before them, progress can be made in reaching an agreement before the present one expires.

Change in Southwestern Rates Suspended

All new rate schedules filed with the Interstate Commerce Commission by Southwestern railroads previously ordered to become operative on June 30 revising freight charges in the lower Mississippi Valley and in the Southwest under decisions rendered in the Memphis-Southwestern investigation were suspended on June 22 by the Interstate Commerce Commission until Oct. 28 next.

Complaints by shippers, the commission said, have produced "sufficient showing to indicate that the suspended schedules produced increases in present rates not authorized or required by the decision." Further, the schedules contained a large number of errors and failed to conform to the commission's requirements.

The railroads concerned were instructed to confer with a shippers' committee on a second revision. General freight agents of Southwestern railroads were named on a committee to represent the carriers, and the commission asked for a report by July 20 on the possibility of reconciling differences. If the schedules can be corrected, the commission will vacate the suspension and allow new schedules to go into effect.

Harding and Daugherty Write to Coal Commission; Sequel to Capellini's Election Seen

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

Two letters of unusual importance were received by the U. S. Coal Commission last week. One was from President Harding urging the importance of an agreement being reached in the anthracite field. The other was from the Attorney General pointing out that it would be in violation of our statutes if the alleged agreement exists whereby British coal diggers would not mine coal for shipment to the United States during a strike here and whereby the American union would conduct itself similarly during a strike in the British Isles.

It is apparent that the commission made no mistake in the appraisal of the value of the two propositions. The daily press attached great news value to the Attorney General's letter, but gave only incidental attention to the letter of President Harding. The President's letter undoubtedly was prompted by the election of Rinaldo Capellini to the presidency of District No. 1 of the United Mine Workers of America. This victory for the radicals among the workers in the anthracite region reaffirms the presence of a dangerous unrest among them, which had its first outbreak in the demand for nationalization. The fact that the radicals are in the saddle in District No. 1 increases greatly the difficulties which must be overcome before a settlement is reached. The President evidently caught the true significance of Mr. Capellini's election. The Coal Commission is even in a better position to know its important portent. That is why its members apparently attached so much importance to the letter from the White House and seemingly dismissed the letter from the Department of Justice with the statement that they have no information as to such a contract. Chairman Hammond stated positively that John L. Lewis on appearing before the commission, after his return from Europe, gave no intimation of having negotiated any such agreement.

A generally held opinion among coal specialists in Washington is that no such contract exists. The principal reason for believing that no such agreement was negotiated is the fact that Mr. Lewis is not in a position to control exports of coal. The coal which would move to England were the demand sufficient, is produced almost exclusively in non-union fields. The only way he could influence that movement would be to call a strike simultaneously with the British so that the non-union production would be required to meet the requirements of the domestic market, which naturally would have first call on this coal.

The report on Mr. Lewis' return that he had reached some such understanding with the British was not taken seriously by those really acquainted with the coal industry. Mr. Lewis has reached that degree of prominence that he cannot take a vacation without the comment on his visit being replete with speculation as to its purpose. If Judge Gary goes to Europe, articles are printed intimating that he is about to enter into some agreement with Mr. Stinnes or some other steel manufacturer with the idea of lessening competition. In similar fashion, when Mr. Lewis, another industrial magnate, goes abroad, there must be some sinister purpose. The real facts probably are that Mr. Lewis went to Europe on a much-deserved vacation. Naturally he saw the leaders of the British coal miners' organization. It would have been a discourtesy to them had he not done so. They may have talked a little shop, but the chances are that the matter of curtailing coal shipments during strikes was not even mentioned.

For these reasons the Coal Commission naturally may be expected to pay close attention to the imminent thing, referred to in the President's letter, and relegate for opportune consideration the rather fantastic suggestion of the Attorney General.

The importance of the report which the commission will make on anthracite has been increased many fold by the election of Mr. Capellini. When the situation was under the control of the conservative leaders, whose policies and attitude were well known from their long service, it was comparatively easy to forecast what might be expected. The general impression that there would be no strike this year in the anthracite region was based on the knowledge of the conservative policies of such men as Brennan and Kennedy. With the control wrested from their hands, there is doubt as to what the rabble in the union may demand.

TEXT OF PRESIDENT HARDING'S LETTER

The full text of the President's letter, which was addressed to Chairman Hammond, is as follows:

"In acknowledging your brief statement of the progress of the work of the Coal Commission, I wish to express again the high value I put upon the work you are doing. Though this is the season of the year when both temperature and vacation habits may tempt the average citizen to dismiss the subject of coal, the issue remains a serious one, and I therefore bespeak for the forthcoming report of your commission on the anthracite industry a most thoughtful reception. No solution of this vexing economic question can be found except as the general public thoroughly digests the facts you present and decides upon the proper action to take.

"I regret that those who serve the anthracite-consuming public as mine operators and mine workers have not already agreed upon the terms of a new contract, but with your report available on July 1 there should be no delay in reaching a speedy agreement. The public deserves prompt assurance that there will be no interruption after Aug. 31 in the flow of household coal from mine to market.

"As I believe your commission stated in an earlier report, industry and the home alike must be freed from the menace of constant interruption of their coal supply. To that end public opinion must be a well-informed public opinion, and I therefore trust that our citizens may keep up a lively interest in coal in season and out of season. The subject is a most interesting one, but it is much more; the issue is a vital one in that it affects the well-being of the whole nation, and not in a material way alone, for I know questions are before you that strike deep into the very heart of our American institutions."

The full text of Attorney General Daugherty's letter, also addressed to Mr. Hammond, is as follows:

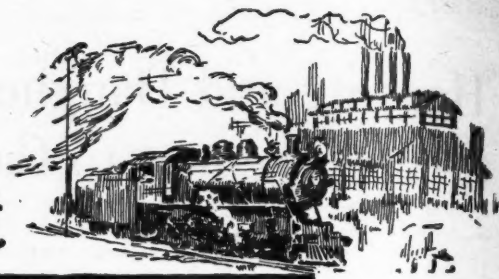
"My attention has been called by publication and otherwise to what is claimed to be a contract entered into or proposed to be entered into between certain officials of the United Mine Workers of America and others in this country with certain officials of a similar organization and others in foreign countries, represented to provide and to agree that in event a strike should be declared or in force in this country in the mining interest, no coal would be mined for shipment to this country by miners belonging to said organizations in such foreign countries during the period of a strike that might be in force in this country.

"I can hardly conceive that any person in this country would enter into such a contract, for I am satisfied that such a contract would be a violation of our laws. If coal were required for transportation purposes for use in interstate commerce in this country, any such interference with the supply of coal will be prevented by the Government of the United States promptly and forcefully.

"I shall be glad to be promptly advised as to the facts in possession of or obtainable by your commission in order that such action may be taken as is justifiable."



Production and the Market



Weekly Review

Signs are not lacking that the production of bituminous coal, which has been sustained at an average of 10,500,000 tons per week through the first half of the year, is due to fall off during July and August. Industrial revival is receiving a setback in the decreasing activity of the New England textile plants, where retrenchment in production of cotton goods has been going on quietly for the past two months. It is reported that the steel industry around Pittsburgh will suspend operations for the entire first week of July, ostensibly because of hot weather and Independence Day celebrations. In fact, however, buying of steel has not kept pace with production, and with decreasing orders on the books the steel industry is understood to welcome a week's vacation.

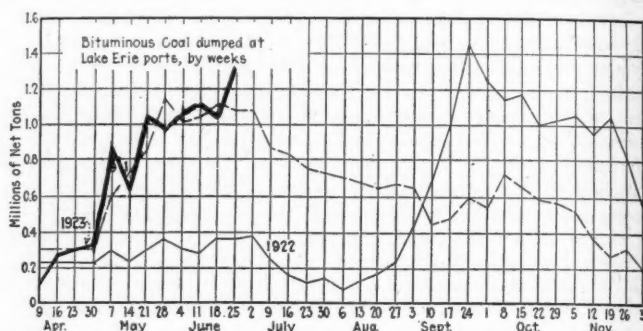
Production of bituminous coal at the rate of 546,000,000 tons per year is generally conceded to be well above consumption and it is well known in the trade that buyers have been taking in coal for storage in considerable quantities in the past two or three months. The movement to store coal is losing its impetus with hot weather and declining prices. Around St. Louis interest in piling up reserves has fallen off and at Chicago the large industries are now putting their money into low-priced "no-bills." In New England, buyers are cancelling orders placed last month. Buyers in this territory have been successful in beating the price down by playing Southern coals by water against Pennsylvania all-rail coal.

An ever-present prescription for active summer production—the Lake trade—also is due for an early slump. Accumulations at Lake Erie ports are now practically double normal, while the market for Eastern coals in the Northwest is being seriously challenged by all-rail coal from Illinois.

Coal Age Index of spot prices of bituminous coal at the mines for the second week in succession declined five points, standing now at 205, which corresponds to

an average mine price of \$2.48. The price will continue to fall so long as production is maintained at the present level, for there is not sufficient tonnage under contract to warrant operators throwing additional output on the market at prices that in a great many instances do not return cost of production. Shippers to New York Harbor have put on the brakes and accumulations at the piers are now sufficiently low to steady the price.

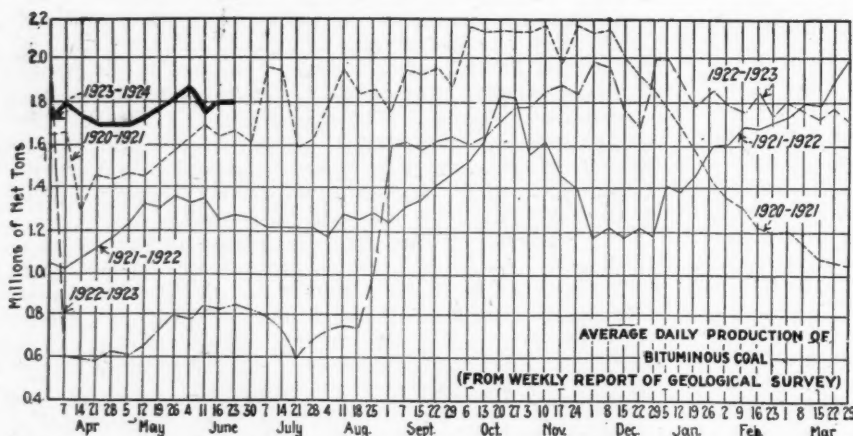
According to the Geological Survey the production of bituminous coal in the week ended June 16 was 10,775,000 net tons with approximately the same figure in the week ended June 23. The total for the six months ending with June will thus be approximately 273,000,000



net tons. Each week there is less complaint of car shortage and lack of demand has become the dominant factor limiting production, save in a strip of territory in the Appalachian fields from eastern Ohio south to Fairmont, southern West Virginia and through to eastern Kentucky and Tennessee, where the operators report demand for cars in excess of those furnished.

At Hampton Roads dumpings are steadily declining, both exports and New England shipments falling off. In consequence, the price of Pocahontas coal has been beaten down severely in the last few weeks.

Lake coal dumped in the week ended June 25 was the



Estimates of Production

(Net Tons)

BITUMINOUS

	1922	1923
June 2	4,616,000	10,091,000
June 9 (b)	5,136,000	10,676,000
June 16 (a)	5,013,000	10,775,000
Daily average	836,000	1,796,000
Calendar year	177,261,000	252,593,000
Daily av. cal. year	1,244,000	1,779,000

ANTHRACITE

June 2	8,000	1,606,000
June 9	13,000	2,046,000
June 16	22,000	2,053,000
Calendar year	21,877,000	47,245,000

COKE

June 9 (b)	99,000	406,000
June 16 (a)	106,000	390,000
Calendar year	2,993,000	9,241,000

(a) Subject to revision. (b) Revised from last report

highest recorded this year and very near the top record of any year. Cargo coal was 1,278,428 net tons and fuel coal 66,052, a total of 1,344,480, which brings the total for the season to date as over 9,253,000 tons.

The anthracite market is exceedingly active; production is at high level and distribution is keeping pace with production. Dealers are contending for coal on the one hand and competing for customers on the other.

The beehive coke market is easy because the merchant furnaces are uncertain about third- and particularly about fourth-quarter business. Both beehive and byproduct output, however, continue high.

Chicago Trading Is Stagnant

Coal continued to drag bottom in the Chicago market during the past week. Nothing was in demand except a fair volume of anthracite and smokeless for a slightly reviving domestic trade. Bituminous steam-coal consumers took what there was on the tracks at rock-bottom prices, thus relieving most mines of no-bills. However, buyers evidently consider this a market strictly belonging to them. Nobody is making any money on coal. The storage move-

ment, which gained headway in this section only through the purchases of the Illinois Central, the Burlington and Big Four railroads and a few industrial plants, shows no sign of spreading. Northwest trade won by Illinois and Indiana shippers is proving a lifesaver for many a coal concern. However, dock operators are bidding strong to end the rail invasion of their old time territory.

Field reports from Illinois are that second-grade screenings in Williamson County have been selling down to \$1.40 though that is far below the circular. But for that matter, independent operators have been undercutting the circular more than \$1 on domestic sizes. Persistent reports of \$3.75@3.85 lump coal even from the association mines have spread over the Middle West. Independents sell nut and egg for \$2.50@3 and lump for \$3@3.25. But there isn't much business even at that price. Exceptional indeed is the mine that works over three days a week.

It's Warm in St. Louis

The warm wave which hit St. Louis during the week practically put an end to storage coal. It got the customer away from the thought of coal and it brought relief to the dealer because of the threat of a drivers' strike. Anthracite and smokeless for St. Louis have been practically shut

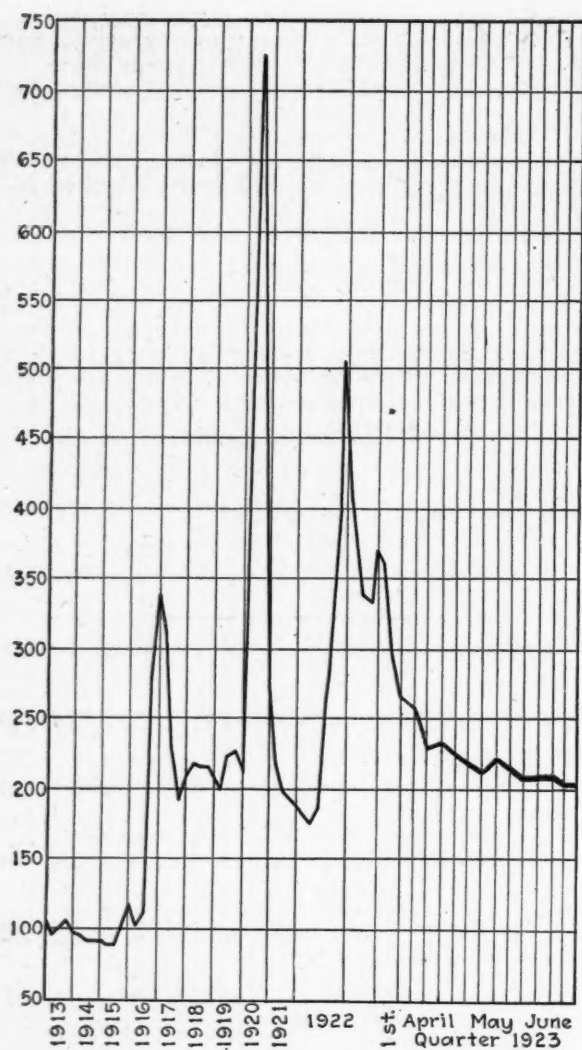
Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

		June 26	June 11	June 18	June 25†			June 26	June 11	June 18	June 25†
Low-Volatile, Eastern		1922	1923	1923	1923	Market Quoted		1922	1923	1923	1923
Smokeless lump.....	Columbus	\$3.65	\$6.25	\$6.25	\$6.00@6.25	Pitts. No. 8 mine run....	Cleveland...	\$3.90	\$2.05	\$1.90	\$1.85@1.95
Smokeless mine run.....	Columbus	3.45	4.25	3.90	3.50@3.75	Pitts. No. 8 screenings...	Cleveland...	3.90	1.40	1.20	1.15@1.35
Smokeless screenings.....	Columbus	3.35	3.60	3.60	3.50@3.75	Midwest					
Smokeless lump.....	Chicago	3.65	6.10	6.10	6.00@6.25	Franklin, Ill. lump.....	Chicago	4.05	4.05	3.75@4.35	
Smokeless mine run.....	Chicago	3.40	4.10	3.85	3.75@4.00	Franklin, Ill. mine run....	Chicago	3.10	3.10	3.00@3.25	
Smokeless lump.....	Cincinnati	3.65	6.25	6.35	6.00	Franklin, Ill. screenings...	Chicago	1.80	1.80	1.75@1.85	
Smokeless mine run.....	Cincinnati	3.45	4.10	4.25	3.00@4.00	Central, Ill. lump.....	Chicago	2.60	2.60	2.50@2.75	
Smokeless screenings.....	Cincinnati	3.15	4.00	4.10	2.50@4.00	Central, Ill. mine run....	Chicago	2.10	2.10	2.00@2.25	
*Smokeless mine run.....	Boston	6.10	6.10	5.85	5.50@5.75	Central, Ill. screenings...	Chicago	1.60	1.60	1.50@1.75	
Clearfield mine run.....	Boston	3.30	2.60	2.35	2.00@2.75	Ind. 4th Vein lump.....	Chicago	3.35	3.35	3.25@3.50	
Cambria mine run.....	Boston	3.65	3.10	3.00	2.50@3.25	Ind. 4th Vein mine run....	Chicago	2.60	2.60	2.50@2.75	
Somerset mine run.....	Boston	3.40	2.85	2.75	2.25@3.00	Ind. 4th Vein screenings...	Chicago	1.80	1.80	1.75@1.85	
Pool 1 (Navy Standard)	New York	4.45	3.75	3.75	3.50@4.00	Ind. 5th Vein lump.....	Chicago	2.85	2.85	2.75@3.00	
Pool 1 (Navy Standard)	Philadelphia	3.85	3.70	3.65	3.35@4.00	Ind. 5th Vein mine run....	Chicago	2.10	2.10	2.00@2.25	
Pool 1 (Navy Standard)	Baltimore	4.40	2.80	2.75	2.50@3.00	Ind. 5th Vein screenings...	Chicago	1.55	1.55	1.50@1.65	
Pool 9 (Super. Low Vol.)	Philadelphia	4.30	2.80	2.75	2.50@3.20	Standard lump.....	St. Louis	2.35	2.35	2.25	
Pool 9 (Super. Low Vol.)	Baltimore	3.75	2.75	2.80	2.75	Standard mine run.....	St. Louis	1.80	1.80	1.75	
Pool 9 (Super. Low Vol.)	New York	3.95	2.50	2.35	2.25@2.75	Standard screenings...	St. Louis	1.50	1.50	1.30@1.40	
Pool 10 (H.Gr. Low Vol.)	Philadelphia	4.00	2.25	2.20	2.15@2.40	West Ky. lump.....	Louisville	4.10	2.30	2.25	
Pool 10 (H.Gr. Low Vol.)	Baltimore	3.75	2.25	2.45	2.45	West Ky. mine run....	Louisville	4.10	1.75	1.75	
Pool 10 (H.Gr. Low Vol.)	New York	3.75	2.00	2.00	1.75@2.20	West Ky. screenings...	Louisville	4.10	1.35	1.35	
Pool 11 (Low Vol.)	Philadelphia	3.75	1.90	1.90	1.70@2.10	West Ky. lump.....	Chicago	4.20	2.35	2.35	
Pool 11 (Low Vol.)	Baltimore	3.75	2.00	2.25	2.25	West Ky. mine run....	Chicago	4.20	1.45	1.45	
High-Volatile, Eastern						South and Southwest					
Pool 54-64 (Gas and St.)	New York	3.90	1.85	1.80	1.65@2.00	Big Seam lump.....	Birmingham..	2.20	3.05	3.05	
Pool 54-64 (Gas and St.)	Philadelphia	2.10	1.80	1.80	1.50@1.90	Big Seam mine run....	Birmingham..	1.95	2.05	2.05	
Pool 54-64 (Gas and St.)	Baltimore	3.75	1.90	1.75	1.75	Big Seam (washed).....	Birmingham..	1.85	2.35	2.35	
Pittsburgh ac'd gas.....	Pittsburgh	2.85	2.80	2.75@2.90		S. E. Ky. lump.....	Chicago	3.65	3.25	3.25	
Pittsburgh mine run (St.)	Pittsburgh	2.20	2.05	2.00@2.10		S. E. Ky. mine run....	Chicago	3.40	2.35	2.35	
Pittsburgh slack (Gas)	Pittsburgh	1.55	1.50	1.50		S. E. Ky. lump.....	Louisville	3.60	3.50	3.50	
Kanawha lump.....	Columbus	3.65	2.80	2.80	2.75@3.25	S. E. Ky. mine run....	Louisville	3.40	2.25	2.10	
Kanawha mine run.....	Columbus	3.40	2.05	2.05	1.75@2.00	S. E. Ky. screenings...	Louisville	3.30	1.65	1.35	
Kanawha screenings...	Columbus	3.30	1.65	1.45	1.25@1.50	S. E. Ky. lump.....	Cincinnati	3.75	3.10	3.60	
W. Va. lump.....	Cincinnati	3.50	3.25	3.60	3.00@3.50	S. E. Ky. mine run....	Cincinnati	3.35	1.65	1.75	
W. Va. Gas mine run....	Cincinnati	3.50	1.80	1.75	1.50@2.00	S. E. Ky. screenings...	Cincinnati	3.15	1.50	1.35	
W. Va. Steam mine run..	Cincinnati	3.40	1.80	1.75	1.50@2.00	Kansas lump.....	Kansas City..	5.00	4.00	4.00	
W. Va. screenings.....	Cincinnati	3.15	1.35	1.25	1.00@1.25	Kansas mine run....	Kansas City..	4.25	3.25	3.25	
Hooking lump.....	Columbus	3.65	2.60	2.75	2.50@3.00	Kansas screenings...	Kansas City..	3.05	2.60	2.60	
Hooking mine run.....	Columbus	3.45	1.85	1.90	1.75@2.00	* Gross tons, f.o.b. vessel, Hampton Roads.					
Hooking screenings...	Columbus	3.45	1.35	1.20	1.15@1.25	† Advances over previous week shown in heavy type, declines in italics.					
Pitts. No. 8 lump.....	Cleveland	3.95	2.80	2.75	2.15@3.25						

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Freight Rates	Latest Independent	Pre-Strike Company	June 18, 1923 Independent	June 18, 1923 Company	June 25, 1923† Independent	June 25, 1923† Company
Broken.....	New York	\$2.34		\$7.60@7.75		\$7.75@8.35		\$7.75@8.35
Broken.....	Philadelphia	2.39	\$7.00@7.50	7.75@7.85		7.00@8.10		7.00@8.10
Egg.....	New York	2.34	7.60@7.75	7.60@7.85	\$8.50@11.50	8.00@8.35	\$8.50@11.50	8.00@8.35
Egg.....	Philadelphia	2.39	7.25@7.75	7.75	9.25@10.50	8.10@8.35	9.25@10.50	8.10@8.35
Egg.....	Chicago	5.09	7.50	8.25	7.60@10.25	7.25@7.45	7.60@10.25	7.25@7.45
Stove.....	New York	2.34	7.90@8.20	7.90@8.10	8.50@11.50	8.00@8.35	8.50@11.50	8.00@8.35
Stove.....	Philadelphia	2.39	7.85@8.10	8.05@8.25	9.25@10.00	8.15@8.35	9.25@10.00	8.15@8.35
Stove.....	Chicago	5.09	7.75	8.25	7.60@10.25	7.25@7.45	7.60@10.25	7.25@7.45
Chestnut.....	New York	2.34	7.90@8.20	7.90@8.20	8.50@11.00	8.00@8.35	8.50@11.00	8.00@8.35
Chestnut.....	Philadelphia	2.39	7.85@8.10	8.05@8.15	9.25@10.50	8.15@8.35	9.25@10.50	8.15@8.35
Chestnut.....	Chicago	5.09	7.75	8.25	7.60@10.25	7.25@7.45	7.60@10.25	7.25@7.45
Ranges.....	New York	2.34				8.30		8.30
Pea.....	New York	2.22	5.00@5.75	5.75@6.45	7.25@8.00	6.00@6.30	7.25@8.00	6.00@6.30
Pea.....	Philadelphia	2.14	5.50@6.00	6.10@6.25	7.00@7.25	6.15@6.20	7.00@7.25	6.15@6.20
Pea.....	Chicago	4.79	6.00	6.25	6.25@7.25	5.50@5.65	6.25@7.25	5.50@5.65
Buckwheat No. 1.....	New York	2.22	2.75@3.00	3.50	2.75@3.50	3.50@4.15	2.75@3.50	3.50@4.15
Buckwheat No. 1.....	Philadelphia	2.14	2.75@3.25	3.50	2.75@3.50	3.50	2.75@3.50	3.50
Rice.....	New York	2.22	2.00@2.50	2.50	2.00@2.50	2.50	2.00@2.50	2.50
Rice.....	Philadelphia	2.14	2.00@2.50	2.50	1.75@2.50	2.50	1.75@2.50	2.50
Barley.....	New York	2.22	1.50@1.85	1.50	1.25@1.50	1.50	1.25@1.50	1.50
Barley.....	Philadelphia	2.14	1.50@1.75	1.50	1.15@1.50	1.50	1.15@1.50	1.50
Birdseye.....	New York	2.22		2.00@2.50		1.60		1.60

*Net tons, f.o.b. mines †Advances over previous week shown in heavy type, declines in italics.



Coal Age Index 205, Week of June 25, 1923. Average spot price for same period, \$2.49. This diagram shows the relative, not the actual prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the War Industries Board.

off with the claim that it must move eastward. Arkansas anthracite is hard to get on account of no market for the steam size. The coke situation eased up some and a little is available, but it is not being put in.

The coal that is moving best is Carterville, but not in any volume. The school coal is being put in and a little apartment house Standard, but Mt. Olive is not moving.

Kentucky Market Weaker

Further weakness was shown in some sizes over the past week, eastern Kentucky lump coal of the non-gas varieties slumping slightly, while screenings are a shade weaker. A fair movement is reported to the Lakes, which is causing weakness in screenings.

It is asserted that there is not much Lake business on the open market; it all being well pooled, or contracted with the big operators, while there is not much steel or big business reaching the open market. Byproduct buyers are not active.

General industrial business is being made up of numerous small orders, with a fair volume going to public utilities, which are meeting with a good current consumption. Railroads are giving Kentucky fields 95 to 100 per cent car supply.

Marked irregularity in the steam-coal market has taken place at the Head-of-the-Lakes and a drop of 50c. has come

in all grades except screenings. The lack of demand has never been so noticeable at this time of year as it is at present, according to dock men, who report business at a virtual standstill. Strange as it may seem, in view of last year's suffering in hard coal, there is little demand for anthracite.

The Milwaukee market continues very quiet. Jobbers report absolutely no demand in the country. Prices on coal and coke are firmly maintained at the May schedule. Whatever cutting is being done in soft coal is kept well under cover. The inflow of coal by lake continues satisfactory.

At Minneapolis out of the scramble for business by all classes of all-rail and dock interests, there is developing a small amount of contract tonnage. This is proving somewhat surprising, for the rail trade has assumed that it had the dock trade beaten by better than \$1 on steam coals.

Colorado Prices Stiffen

The price of bituminous coal was increased 25c. by all Colorado operators July 1. Lump coal from Walsen and Canon City is selling at \$5.25 compared to the July price of \$5.50. Nut coal is selling at 50c. less. No change has been noted in the price of mine run at \$4 and slack at \$2.50. Lump coal from Trinidad sells at \$4.50 and nut at \$4.25.

The cold snap of the past few days at Salt Lake City has made retailers busy filling small orders. Storage business has not increased. Production is increasing and the mines are working around three days a week.

At Kansas City with the prospect of another hike in the price of domestic grades of coal July 1, there still is no evidence of increased storage. A little threshing coal is moving more briskly as the harvest moves north. There is scarcely enough business to keep mines operating one day a week.

Slowness Pervades Ohio Markets

The trade at Columbus continues dull and quiet. Buying is at low ebb and large users, especially of steam coals, are content to buy in the open market. Lack of demand has caused many mines to close down. Railroads are good buyers. Contracting for large tonnages is not active and efforts to make renewals have not met with much success. The market at Cincinnati is slow. There is plenty of coal to be had but buyers are not in the buying mood. Demand for domestic 4-in. lump and block has fallen off. Quotations for West Virginia 2-in. lump on June 25 was \$2.50@ \$3, as compared with \$2.75@ \$3 the previous week, and for southeastern Kentucky 2-in. lump \$2.50@ \$3, there being no change from the previous week's quotations. Demand for the steam coals in the Cleveland market has dwindled to a standstill. Operations at some of the mines has been curtailed because of the lack of orders, while others have been closed entirely. The retail trade is quiet. Production in the eastern Ohio No. 8 district for the week ended June 16 was 414,000 tons, a decrease of 9,000 tons from that of the preceding week.

The spot market at Pittsburgh is easy, with prices at about last April's level. While production is less than it was early in the month, it is still above that in the early part of the year, the increase being represented in the demand for lake trade.

Buying at Buffalo is slow. Consumers are in no hurry to buy.

Dullness Marks New England Market

The New England steam-coal market is settling down into old-fashioned midsummer dullness. Buyers are not interested, and in spite of declining prices there are few who will avail themselves of opportunities to stock coal for the fall and winter. Purchases made a month ago do not look so good, and in more cases than might be supposed there have been requests to suspend shipments, and even cancellations where buying had been more extended than justified by the current rate of consumption. A great many manufacturing plants are curtailing, and each day we hear new instances where textile mills have been obliged to shut down either for two or three days a week or for a period of two to three weeks together.

Pocahontas and New River grades are in ample supply at all points, with Hampton Roads prices softening almost from day to day; \$5.75 per gross ton f.o.b. vessel is now an open figure for Navy Standard coals and several of the

agencies are making quiet canvasses to place output for the time being at a figure materially less. This condition naturally is being reflected at this end, where coal offered for inland delivery has now been sold well down to \$7 per gross ton on cars Boston, Providence, or Portland.

Inquiry for the central Pennsylvania coal's is correspondingly light. Strenuous efforts are being made to place current output, but even at well-shaded quotations there is little interest on the part of steam users. Enough tonnage was bought all-rail to show the Hampton Roads agencies that price returns are not wholly in their control.

The heavy volume of steam and gas coals that has been characteristic of the Philadelphia piers the past 60 days has now begun to decline. The pressure to get shipments forward has relaxed. There is something of a tonnage at the piers "on consignment" for which no disposition is at hand, and from rumors in the trade there are some bargains to be had in quality grades, both from Somerset and the Cambria districts.

New York Market in Better Shape

Decreased shipments to tidewater has placed the New York market in better shape. Receipts at the terminals have been reduced and there is less coal in boats. Local shippers do not look for a revival until about September. Little interest is being shown in the Philadelphia market and spot sales are limited. On the other hand, contracts are being kept in most instances. Unless custom is reversed shippers expect consumers, as in former years, to begin to lay in a little extra tonnage in July.

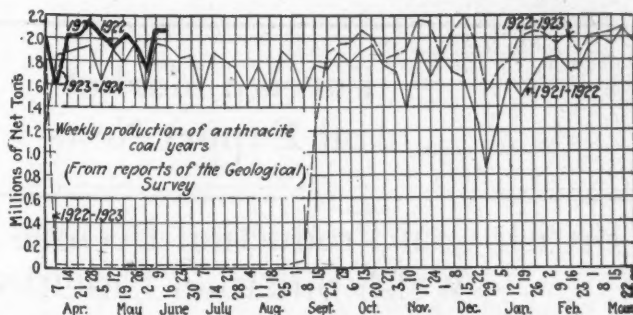
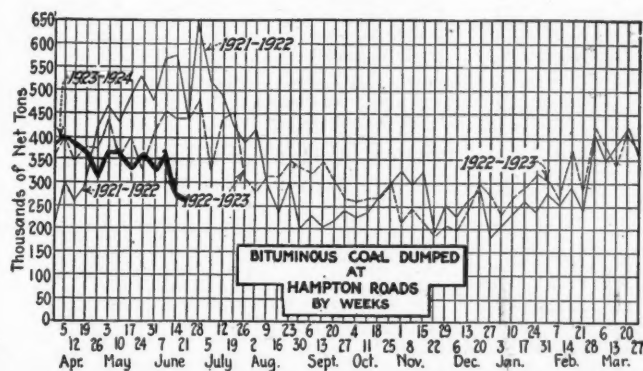
There is little activity in the soft-coal market at Baltimore, although for the first time in several years the bins of over one hundred school buildings have been filled and it is expected that fifty others will be filled by Aug. 1. Industrial-plant owners, however, seem to entertain no uneasiness as to their ability to get coal when needed.

At Birmingham scarcely any new business is being taken on. Inquiry is limited and orders booked are small. Consumers are taking only enough coal for immediate requirements. Domestic business is good but operators are handicapped by the slowness of the steam-coal market.

There arrived at Duluth last week fifty-nine cargoes of coal of which five were anthracite. Only seventeen, however, are reported en route from the lower lakes, of which but two are anthracite. Stocks on the docks on June 15 were estimated at 2,100,000 tons of bituminous coal and 175,000 tons of hard coal. So far, cargo receipts at Milwaukee aggregate 239,819 tons of anthracite and 925,951 tons of soft coal, or about 44 per cent of the total amount received during the navigation season of 1922. Demand at Pittsburgh for lake coal has been poor due to the large quantities on docks and in transit. Shipments of anthracite from Buffalo for the week were reported at 93,500 tons, of which 38,600 tons went to Duluth and Superior, 19,600 tons to Chicago, 14,500 tons to Manitowoc, 11,000 tons to Milwaukee, 5,000 tons to Two Rivers, 3,000 tons to Sheboygan and 1,800 tons to Racine.

Lack of Stove Size in Anthracite Market

Lack of stove coal is the outstanding feature of the anthracite market. Demand for this size continues heaviest, with egg a close second. Chestnut is gaining in strength. Consumers are anxiously watching the outcome of the



miners' convention being held this week in Scranton. In New York and Philadelphia retail dealers are urging their customers to take in a small portion of buckwheat coal. Supplies are being received slowly at Baltimore.

"Anthracite production was well maintained during the second week of June," says the Geological survey report, "and again passed the 2,000,000-ton mark. The nine principal anthracite carriers reported loading 39,249 cars and with this as the basis the total output was estimated at 2,053,000 net tons. In addition to the tonnage shipped, this estimate includes an allowance for mine fuel, sales to the local trade, and the output from dredges and washeries.

"The cumulative production during 1923 to date, which stands at approximately 47,245,000 tons, compares favorably with the years of maximum production, and is considerably more than twice the output during the corresponding period of 1922."

Beehive Coke Output Drops 4 Per Cent

The Geological Survey in its report says: The production of beehive coke declined somewhat in the week ended June 16. Using as a basis the number of cars loaded, the total output is estimated at 390,000 net tons. Compared with the 406,000 tons produced in the week preceding, this was a decrease of nearly 4 per cent. The reduction occurred principally in Pennsylvania and Ohio.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Jan. 1 to Apr. 1, 1922 Inclusive	Sept. 5 to Dec. 30, 1922 Inclusive	Jan. 1 to June 9, 1923 Inclusive	Week Ended June 9, 1923
U. S. Total.....	55.7	36.3	40.5	58.8
Somerset County.....	74.9	36.3	40.5	58.8
Panhandle, W. Va.....	51.3	57.3	58.3	67.1
Westmoreland.....	58.8	65.8	59.4	80.3
Virginia.....	59.9	55.7	58.3	65.9
Harlan.....	54.8	22.1	22.4	36.4
Hazard.....	58.4	16.4	27.4	37.8
Pocahontas.....	60.0	36.6	40.2	47.3
Tug River.....	63.7	28.8	38.8	50.1
Logan.....	61.1	26.2	32.8	41.5
Cumberland-Piedmont.....	50.6	31.7	51.7	68.7
Winding Gulf.....	64.3	30.4	37.0	40.3
Kenova-Thacker.....	54.3	42.4	38.2	39.5
N. E. Kentucky.....	47.7	28.4	24.2	38.1
New River.....	37.9	31.6	38.4	46.1
Oklahoma.....	59.6	59.1	44.8	56.3
Iowa.....	78.4	75.9	70.0	64.8
Ohio, Eastern.....	46.6	40.8	42.3	69.8
Missouri.....	66.8	76.3	69.3	63.0
Illinois.....	54.5	49.9	42.2	30.2
Kansas.....	54.9	55.9	47.7	56.5
Indiana.....	53.8	37.7	46.7	40.3
Pittsburgh†.....	39.8	41.2	42.8	71.9
Central Pennsylvania.....	50.2	53.4	51.6	65.7
Fairmont.....	44.0	35.5	43.2	61.5
Western Kentucky.....	37.7	32.4	31.6	28.1
Pittsburgh*.....	31.9	56.1	66.2	82.6
Kanawha.....	13.0	15.6	25.2	36.1
Ohio, Southern.....	24.3	38.1	31.1	36.0

* Rail and river mines combined.

† Rail mines.

(a) No report.

Car Loadings, Surpluses and Shortages

	All Cars	Cars Loaded Coal Cars
Week ended June 9, 1923.....	1,013,249	190,149
Previous week.....	932,041	171,248
Same week in 1922.....	836,208	94,673

	Surplus Cars All Cars	Coal Cars	Car Shortage
June 7, 1923.....	41,106	3,528	12,978
Same date in 1922.....	284,189	180,831	8,926
May 31, 1923.....	32,443	3,953	16,277

Foreign Market And Export News

British Coal Production Declines Slightly; Welsh Situation Unsettled

Coal output of Great Britain's mines during the week ended June 9 was 5,654,000 tons, says a cable to *Coal Age*. This was 73,000 tons less than the previous week's production. Quotations for most grades for the week ended June 23 also show a decline from the previous week.

The general situation in Wales is somewhat unsettled. Prices are slightly lower and buying is of the hand-to-mouth variety. The three-shift working has come into operation at the Welsh docks, except Newport, where the decision to work extra time has been deferred temporarily. Inquiries from abroad continue to be substantial, particularly from France, Italy, Egypt, South America and the coaling depots.

The quiet tone of the north of England market continues, due to erratic exchange movements, congestion of European ports of discharge, and impending developments in the Ruhr.

Upon his return to London from the United States Sir David Llewellyn, a Welsh coal-mine operator, announced, according to a cablegram, that he had made contracts for shipping to the United States 1,000,000 tons of Welsh anthracite yearly for five years.

A cablegram from American Commercial Attaché Tower at London to F. R. Wadleigh, Federal Fuel Distributor, at Washington, dated June 20, states that the coal trade at Newcastle is reviving and that the Prime Minister had been requested to appoint a committee to investigate the coal industry. It was thought that this would satisfy the forces opposing the minimum wage bill and avoid a crisis if the bill fails to become law.

French Market Shows Little Change

Very little change is to be noted since last week in the situation of the French coal market. If anything, the industrial demand is slightly quieter than it was two or three months ago. However, mines of the Nord and Pas-de-Calais have booked for June nearly the same volume of orders as they had for May and none of them seems to have

anything to dispose of for prompt delivery.

There is an extremely active demand for domestic coals, which is rather unusual at this time of the year. The strike of Belgian railwaymen—called off on June 1—which has indirectly caused some depletion of stocks of Belgian coals at Paris retail coal dealers, contributed, no doubt, to this activity.

An insufficiency of railway stock supplies is reported, as well as a rise from 20f. to 21f. 50c. in the canal freight rate on coal from Bethune to Paris.

Coals from the Saar field are coming in again on the French Eastern markets.

Prices and Dumpings Lower at Hampton Roads

Business at Hampton Roads reacted last week, to a seasonable dullness which was anticipated by shippers. The piers seemed likely to reach the low level in dumpings for the last twelve months, and gave indications that the month's movement would fall 500,000 tons below the corresponding period of last year.

Heavy movement of coal to the West by rail over the Norfolk & Western and Chesapeake & Ohio was held largely responsible for the slowing up of business, supplies on hand having dwindled to a low point. Prices were being forced steadily down, reaching the low level for the year.

The absence of contracts was one of the features of the market. Shippers did not expect any material revival of business for the next thirty days, but were prepared for the dullness which had set in.

Germany Receives Heavy Coal Imports

During the first three months of 1923 there were imported into Germany 6,689,617 metric tons of coal and 115,675 tons of coke, as compared with 641,792 tons of coal and 3,235 tons of coke in 1922. Importations during the corresponding period of 1913 were 2,177,843 tons of coal and 139,996 tons

of coke. Of the coal received in 1923 Great Britain furnished 2,382,687 tons, Polish Upper Silesia, 4,046,141 tons, Czechoslovakia, 119,290 ton and the Sarre district, 103,371 tons.

Since the Ruhr blockade Germany with regard to coal supply, has been divided, the occupied zones which are self supporting, and the interior which is strongly dependent upon imports.

It is estimated that the ordinary supply from the Ruhr to the interior of Germany was about 4,000,000 tons monthly, but the present situation has been relieved by business depression, running import contracts exceeding the demand.

Imports of coal by months so far this year have been: January, 1,870,127 tons, February, 1,421,832 tons and March 3,397,658 tons.

Export Clearances, Week Ended June 23, 1923

FROM BALTIMORE		Net Tons
For Algeria:		
Gk. SS. Ioleos		8,657
For Canada:		
Dan. SS. Berlin		3,173
For Chile:		
Br. SS. Beckenham		5,455
For Cuba:		
Am. SS. Mangore		5,591
For France:		
Fr. SS. Lorient		6,701
For Germany:		
Swed. SS. Kiruna		6,946
Jap. SS. Brazil Maru		8,700
For Italy:		
Ital. SS. Ignazio Florio		8,058
Ital. SS. Emanuel Accome		12,582
Ger. SS. Lancastrian		4,873
FROM HAMPTON ROADS		
For Brazil:		
Nor. SS. August, for Rio de Janeiro ..		7,492
For Cuba:		
Swed. SS. Graecia, for Havana		2,672
For West Indies:		
Nor. SS. Fram, for Barbados		4,052
Nor. SS. Thordis, for Martinique		4,000

Hampton Roads Pier Situation

N. & W. piers, Lamberts Ct.:	June 14	June 21
Cars on hand	998	1,132
Tons on hand	60,102	67,979
Tons dumped for week	88,685	70,795
Tonnage waiting	5,300	12,275
Virginian Ry. piers, Sewalls Pt.:		
Cars on hand	1,764	1,676
Tons on hand	100,020	93,570
Tons dumped for week	95,698	118,279
Tonnage waiting	14,888	19,981
C. & O. piers, Newport News:		
Cars on hand	1,357	2,465
Tons on hand	71,935	124,873
Tons dumped for week	68,033	47,517
Tonnage waiting	12,880	

Pier and Bunker Prices, Gross Tons

PIERS		June 16	June 23†
Pool 9, New York	\$5.50@ \$6.00	\$5.60@ \$6.00	\$5.60@ \$6.00
Pool 10, New York	4.75@ 5.00	4.75@ 5.25	4.75@ 5.25
Pool 11, New York	4.00@ 4.75	4.00@ 4.65	4.00@ 4.65
Pool 9, Philadelphia	5.45@ 5.85	5.45@ 5.85	5.45@ 5.85
Pool 10, Philadelphia	4.55@ 5.25	4.55@ 5.25	4.55@ 5.35
Pool 11, Philadelphia	3.75@ 4.40	3.75@ 4.40	3.75@ 4.40
Pool 1, Hamp. Roads ..	5.75	5.65	5.65
Pools 5-6-7, Hamp. Rds	4.85	4.75	4.75
Pool 2, Hamp. Roads ..	5.65	5.40	5.40
BUNKERS		June 16	June 23†
Pool 9, New York	5.80@ 6.30	5.90@ 6.30	5.90@ 6.30
Pool 10, New York	5.05@ 5.30	5.05@ 5.55	5.05@ 5.55
Pool 11, New York	4.30@ 5.05	4.30@ 4.95	4.30@ 4.95
Pool 9, Philadelphia	5.85@ 6.05	5.85@ 6.05	5.85@ 6.05
Pool 10, Philadelphia	4.85@ 5.55	4.85@ 5.60	4.85@ 5.60
Pool 11, Philadelphia	4.00@ 4.75	4.00@ 4.75	4.00@ 4.75
Pool 1, Hamp. Roads ..	5.85	5.75	5.75
Pool 2, Hamp. Roads ..	5.65	5.75	5.75

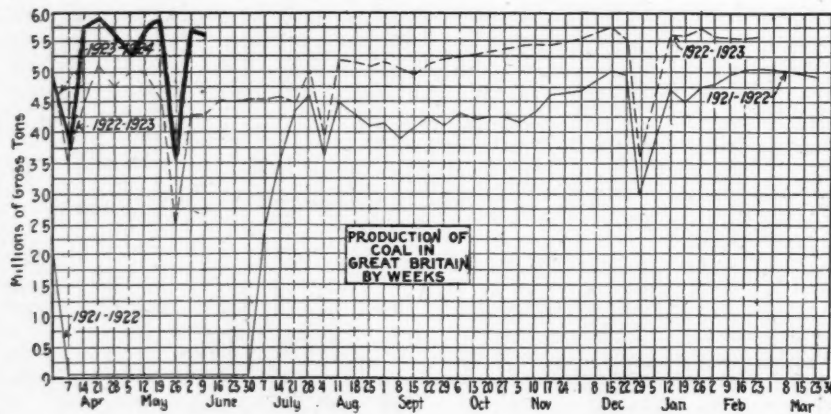
Current Quotations British Coal f.o.b.

Port, Gross Tons

Quotations, by Cable to Coal Age

	June 16	June 23†
Admiralty, large	32s. 6d.	34s. @ 36s.
Steam smalls ..	26s. 3d.	25s. @ 26s. 6d.
Newcastle:		
Best steams ..	27s. @ 28s.	26s. 6d.
Best gas	30s. @ 32s. 6d.	30s.
Best bunkers ..	30s. @ 32s.	26s. @ 30s.

† Advances over previous week shown in heavy type, declines in italics.



News Items From Field and Trade

ALABAMA

Extensive improvements and rehabilitation are in progress at the Townley operation of the Corona Coal Co. preparatory to reopening No. 1 mine, which has been idle for about two years. The company expects to begin producing coal again about July 1.

COLORADO

The effort of Mary L. Milheim and other property owners to have the act creating the Moffat Tunnel Improvement District of Colorado declared unconstitutional failed when the U. S. Supreme Court, in an opinion read by Associate Justice Sanford, June 11, affirmed the action of the State Supreme Court of Colorado in ordering the suit dismissed. The tunnel was declared to be clearly in the public interest, although it might be, as the complainants had asserted, intended for the special benefit of the Denver & Salt Lake R.R., commonly known as "the Moffat road." The act created a special improvement district, with power to issue bonds of \$6,720,000 to tunnel the Continental Divide near Denver, for a railroad and roadway. The Commissioners of the district were empowered to determine the benefits which would accrue to nearby property and to assess this property in proportion. They declared the benefits to be valued at 15 per cent of the assessed value of the property, whereupon a number of property owners joined in a suit to test the constitutionality of the act.

Railroad companies involved in the recent decision of the Colorado Public Utilities Commission lowering freight rates on coal in Colorado have appealed to the Interstate Commerce Commission, and a hearing was scheduled to be held in Omaha, Neb.

ILLINOIS

The Beatty mine at Mascoutah has been closed down for an indefinite period. Officials of the concern do not give the reasons of the shutdown.

The troubles of Mortimer B. Flynn, of Chicago, member of the firm of Pottinger, Flynn & Co., retailers, are many. He not only had trouble with the city of Chicago when a special grand jury investigated the charge that the firm had grossly overcharged the city for coal, but the Federal Government now seeks to prove that Mr. Flynn evaded income tax on an amount in excess of \$400,000. Together with J. Roy Troutman, his auditor, who went to jail rather than turn over the books of the company to the grand jury last fall, he last week surrendered on a secret indictment charging conspiracy to defraud the Government.

Agents supposedly of the Great Northern Railroad have bought a tract of land near Herrin with the intention of opening a new strip mine. The land was purchased from C. C. Russel, of Herrin, and it is announced that the railroad company is now setting machinery and equipment in preparation for starting operations at once. The vein under the tract has an average thickness of seven feet.

The town of Nason, near the new mine of the Illinois Coal Co., was opened June 10 with a boom. Lots are being sold at \$1,100 for business locations, while the resident lots are held at from \$300 to \$200. Many miners are said to be planning to move to the new town and erect houses.

Three judgments have been filed against the Star Coal & Mining Co. of Belleville. These are as follows: The Ottumwa Iron Works, \$4,804.60; the First National Bank, Belleville, \$1,606.25 and the First National Bank, Belleville, a second one for \$6,330. Judge Crow decreed the foreclosure of two mortgages on the mine, allowed the claims of miners totaling \$8,027, and also allowed various mechanics' liens. A mortgage is held by the Lake & Export Co., of Chicago, for \$31,000 and another for \$3,000 by the First National Bank of Belleville. Immediate sale of personal property belonging to the company has been ordered. The date for the public sale of the mine property has not yet been fixed.

An order to sell the assets of the Star Coal & Mining Co. of Freeburg, has been issued by Circuit Judge Crow of Belleville. B. S. Glenn was named as receiver. The order was issued to benefit two mortgages and claims of the miners employed at the mine. The mortgages total \$35,000. The mine owned by the defunct company has not been operated for some time.

The office of the Monmouth Coal Co. at Erereton has been destroyed by fire. The loss was about \$3,000.

Traveling Auditor A. T. Pace, of Herrin, has been notified of his reappointment by the United Mine Workers of America for a period of another two years.

INDIANA

Three suits were filed in Federal Court at Indianapolis, June 20, against the United Mine Workers of America for damages amounting to \$10,000 each for the death of three guards who were killed by rioters at Herrin, Williamson County, Ill., about a year ago. The suits allege that mismanagement of the strike by the United Mine Workers and officials of the organization were responsible for the riots which resulted in the death of the guards. The suits were filed by relatives and estates of the dead men.

The Princeton Mining Co. has been incorporated at Princeton, Ind., with a capital stock of \$200,000 to enter the operating field. The incorporators are J. G. Applegate, Floyd J. Biggs and Harlen L. Kays.

The Railroad Third Vein Coal Co. has been organized in Indianapolis for the purpose of prospecting in coal lands. The company has an initial stock of \$20,000 and the organizers are Edwin J. Marott, L. H. Noble and J. E. Keller.

IOWA

The Board of Supervisors of Polk County, have brought suit against the Bloomfield Coal & Mining Co. for \$250,000. The coal company is accused of having mined coal under the buildings on the Polk County poor farm, between Des Moines and Ankeny, and it is said that the buildings are settling. Cracking walls and unsteady foundations have caused serious damage to the county hospital buildings.

KANSAS

A report of 1922 tonnage in Kansas, made public June 11 by P. E. Keegan, statistical clerk in the office of the state mine inspector, shows that the 1922 tonnage in Kansas was 510,381 less than in 1921. The tonnage for 1922 was 3,518,243; that for 1921 was 4,028,624. To produce this tonnage last year, his report further shows, the mines of the state were worked an average of 139 days. The total number of employees of all kinds about the mines was 9,626. The report for 1921 showed that in that year 10,416 men were employed at the mines, who worked an average of 151 days.

KENTUCKY

The towboat Julius Felischman with a coal tow for the Falls Cities arrived at Louisville the last week in May from the Kanawha (W. Va.) fields, the tow going to several riverside companies in the district.

Willis M. Johnson, of the Emmett O'Neil Coal Co., reports that his company is installing a 45-ft. Barber Green coal conveyor in the local yard of the company. This company also is making coke at its yard, using the Bussey process.

The Louisville Gas & Electric Co., which operates a tippie mine at Echols, has purchased additional property near its big generator plant on the river front at Louisville, and has asked the city to close two small alleys which run through its property. The company is planning to enlarge its coal-storage facilities in Louisville so that it can store nine weeks' coal supply, instead of three weeks'. This property is below street level. This makes it possible

to submerge the fuel supply in event of fire. A permit is to be requested for an overhead track across Third Street for the use of a locomotive crane. The new storage facilities will have a capacity of around 35,000 tons it is reported.

MASSACHUSETTS

The Island Creek Coal Co., Boston, which earned more than \$26 a share on its outstanding common stock in 1922 as compared with about \$20.50 in 1921, and nearly \$69 a share on the preferred against about \$55 in 1921, will have disbursed \$32 in cash dividends in the past eighteen months with a payment of the \$2 regular dividend and \$3 extra on the common on July 2. The policy of the company of late is such as to indicate that it will distribute in dividends substantially its entire earnings. The preferred stock is \$16, cumulative with par of \$1, and the common, of which there is outstanding 118,802 shares, also has par of \$1. At the annual meeting of stockholders on April 11 last it was voted to permit directors of the company to purchase outstanding preferred stock at not exceeding \$105 a share for cancellation.

MINNESOTA

The franchise which was granted for a central heating plant in Duluth was revoked by negative action of the City Council May 21. The franchise provided that work must start in one year. When the time limit expired on May 20 the City Council declined to extend the time limit. The council's action was by a four to one vote. The heating plant would have cost in the neighborhood of \$1,000,000 and would have served the central portion of the city.

T. F. Walker, for many years employed by the C. Reiss Coal Co., at the company's dock at Ashland, Wis., has been made manager to succeed Martin Schrank, resigned. Mr. Schrank was manager of the docks at Ashland for 23 years. The announcement of the appointment was made by Peter Reiss, president.

A jury in the Marion Circuit Court at Minneapolis May 21 awarded to the Panhandle Coal Co. and the Linton-Summit Coal Co. a judgment for \$13,938.03 against the Indiana Railways & Light Co. of Kokomo for coal bought by the latter concern under a contract made in 1920 when the federal government's rule of assigning privilege cars to the public utilities was in effect.

MISSOURI

The Powhatan Coal Co. is developing a new acreage near Huntsville in anticipation of a good fall demand.

The National Steel Rail Co. has moved to new offices, suite 1006-9 Planters Building, St. Louis.

NEW MEXICO

Under the terms of a deal just consummated Charleston (W. Va.) capitalists have control of over 500,000 acres of coal and timber land in New Mexico, the deal involving the sale of 116,000 acres of land of the Jemez Land Co. of Albuquerque to G. A. Porter and associates. The tract just acquired is 15 miles long and 12 miles wide, a large portion of the tract being heavily timbered. Others interested with Mr. Porter are W. M. Williamson, of the Citizens National Bank; W. A. MacCorkle, Citizens National Bank, Frank Porter; Isaac Loewenstein, president of the Charleston National Bank; G. H. Caperton, coal operator; Angus MacDonald, H. M. Bertolet of the New River and Pocahontas Consolidated Coal Co. and Sol May. It is understood that the vein of coal is 16 feet in thickness and of about the same quality as West Virginia coal.

NEW YORK

The Deepwater Coal & Iron Corp., New York City, has increased its capital stock from \$12,000,000 to \$30,000,000.

An offering of 160,000 shares of new common stock of Burns Brothers, which was authorized by stockholders at a special meeting held June 14, is expected to be made soon. Details of the offering, it is understood, are now being arranged. The stockholders approved an issue of 500,000 shares of new common stock. Part of this will be used to exchange for the stock now outstanding. Of the balance it was originally intended that only 25,000 shares would be sold, but this amount has been increased to 160,000 shares.

Osman E. Swartz, of Fairmont, W. Va., has been appointed to succeed the late **Stuart W. Walker** as **chief counsel for the Consolidation Coal Co.**, with headquarters in New York City. His appointment will become effective Aug. 1. For several years Mr. Swartz has been a member of the legal staff of the Monongahela West Penn Public Service Co. He was at one time a member of the law firm headed by John W. Davis, former Solicitor General of the United States.

C. L. Couch, Erie County Fuel Administrator during the emergency, reports to the state that he is well pleased with the co-operation received from the local men and press. He states that by the use of coke, soft coal and other substitutes the fuel office was able to keep the price of anthracite from advancing. Investigation was made of 4,500 alleged illegal deliveries and \$39,895 tons of domestic sizes of anthracite were delivered, responding in all to 140,000 emergency orders and receiving as many as 4,250 applications in one day for coal. No real distress was experienced anywhere.

Dividends declared and awaiting payment, as reported currently in *The Analyst* include the following coal companies:

Company	Rate Per Share	Payable	Books Close
Burns Bros. pf.	1 1/2 Q	July 2	June 26
Consol. Coal, St. Louis	1 1/2 Q	July 1	June 20
American Co.	1 Q	Aug. 1	July 11
Dominion Coal, pf.	1 1/2 Q	Aug. 1	July 12
Island Creek Coal. 2 Q	July 2	June 22	
Island Creek Coal. 3 ex. Q	July 2	June 22	
Island Creek Coal pf 1 1/2 Q	July 2	June 22	
Westmoreland Coal 1 Q	July 2	June 28	

F. M. Felker, formerly vice-president of the McGraw-Hill Company, Inc., and more recently on leave of absence as special agent to the Department of Commerce at Washington, will be associated after his return from Washington, with the staff of the **Society for Electrical Development**, 522 Fifth Avenue, New York City. As a result of the appointment of Mr. Felker the various branches of the electrical industry served by the society will obtain the benefit of his broad experience and background, for he will be available to act as a special counsellor to engineers, manufacturers, central stations, jobbers, contractor-dealers and publishers, and his special training and wide knowledge in the engineering publishing and public relations fields of many industries qualify him eminently for such consulting work. Mr. Felker will retain a consulting relation to the McGraw-Hill Company, Inc., and will continue in a similar capacity his relation to the problems of personnel and organization of the Department of Commerce at Washington.

OHIO

The Columbia Coal Corporation, of Philadelphia, Pa., has contracted with the Roberts & Schaefer Co. for Marcus screen and loading machinery for its new tipple at Salineville.

The **Bitzel Coal Co.**, of Canton, chartered with a capital of \$10,000 by E. M. Bitzel, Ben V. Marconi, Michael Rinaldi, Nick Seavelli and Earl Kopf.

John A. Morris, district manager of the Car Service Division of the American Railway Association, has come out with an urgent demand that pooling arrangements be entered into at the lakes in order to remove the congestion that is cluttering the free movement of empty and loaded cars. June 9 Mr. Morris issued the following statement: "Lake boats require 5,000 to 10,000 tons of coal for a cargo and there are many shippers who have been sending as low as three or four cars to the lake ports where they are sidetracked and held for a further accumulation for the same consignee because, without a pooling arrangement, coal cannot be mixed in transport. Unless coal operators get together and reduce the number of consignees indications are that the free movement of lake coal will be held up all season. Already lines have been forced to use embargoes which will remain in force until the congestion is relieved."

PENNSYLVANIA

The **Western Electric Co., Inc.**, supply department, Philadelphia, has moved the business formerly conducted at Eleventh and York Streets to its new building, 910 Cherry Street.

The **Buck Coal & Supply Co.**, McKees Rocks, has been incorporated. Its capital stock is given as \$5,000 and Charles M.

Ellis, McKees Rocks, is treasurer and one of the incorporators, the others being John B. Beck, New Castle, R. D. 2, and David Beck, Coraopolis, R. D. 1. The purpose of the company is mining, dredging for coal and other minerals.

J. C. H. Lubken, formerly general superintendent of the coal-mining operations of the Cambria Steel Co. at Johnstown, Slickville and Washington County, has opened offices in Johnstown, where he will practice consulting mining engineering, make appraisals and prepare engineer's reports on bituminous-coal properties.

Announcement was made on June 13 of the merger of the **Erie Coal Mining Co.** and the **Argentine Coal Mining Co.**, involving property valued at \$1,500,000. The companies own five operating mines and a large acreage of coal land in the Butler district. Edward Sophitt, of Butler, and Charles Hosford, Jr., of Butler, have been named chairman and president, respectively.

The following coal companies were incorporated recently at the State Department, Harrisburg: **Navy Coal Co.**, Philadelphia, acquiring coal and coal lands and operating them; capital stock, \$5,000; Harry E. Bird, 15th and Market Streets, Philadelphia, treasurer; incorporators, John Barnes, Haverford; Harry E. Bird and E. L. Clarke, Cheltenham. **The Pittston Coal Sales Co., Inc.**, buying and selling and dealing in coal, Pittston; incorporators, James F. O'Boyle, Charles M. O'Boyle and M. J. Mulhill, West Pittston. **Wills Coal Co.**, Uniontown, mining and preparing coal for the market; \$50,000; Thorn J. McClernan, Uniontown; incorporators, Thorn J. McClernan, Harold W. Semans and W. Clark McClernan, Uniontown. **Suffolk Anthracite Collieries Co.**, Scranton, mining, buying, selling and dealing in coal; \$10,000; incorporators, H. W. Reichards, Scranton, treasurer; J. E. Crass, Jr., and R. H. Meech, Scranton. **Calumet Coal Co.**, Pittsburgh, mining and preparing coal for the market; \$5,000; incorporators, J. D. C. Miller, 213 North Elizabeth Street, Pittsburgh, treasurer; C. F. Keifer, Pittsburgh, and David E. Meigs, Swissvale.

Governor Pinchot has announced but one hearing on the bills he had left with him when the Legislature adjourned June 14. This will be held July 9 on the Davis-Fowler mine-cave commission measures.

Dan Rastelli, Washington County coal miner, on June 15 was found guilty of murder in the first degree in connection with the slaying of J. Ross Denny, mine paymaster, in a \$20,000 hold-up in December. Orlando Fabbri and John Burchianti, two others tried with Rastelli, were acquitted.

The **Blanchard Coal Co.**, operating mines at Spruce, Pa., and near Zanesville, Ohio, has inaugurated an airplane service between the Pittsburgh office and the mines for the purpose of preventing shutdowns through delays in obtaining machinery parts in case of breakdowns.

Somerset County authorities and state troopers are conducting a rigid investigation of a mysterious dynamiting at Jerome May 31, when a double frame dwelling house, owned by the Hillman Coal & Coke Co., was badly wrecked. Several occupants of the building, including an infant, were badly shaken up and suffered minor injuries. The report of the explosion was heard for miles and many windows were broken in other houses nearby. The dwelling was so badly damaged that it will be necessary to rebuild the entire structure.

The one-mile tunnel being driven from Catawissa Valley into Green Mountain, near Girard Manor, to drain the Green Mountain workings of the Lehigh & Wilkes-Barre Coal Co., is expected to be completed by the latter part of July or early in August. The water from the workings will flow into Catawissa Creek and it is expected this will make minable extensive veins of coal.

A verdict of not guilty was returned in court at Ebensburg, Cambria County in the case against **Owen J. Flanagan**, mine foreman, charged with involuntary manslaughter in connection with the explosion in the Riley mine at Spangler last November, when 77 men lost their lives. The case against Superintendent William Young was not prosecuted. Judge John E. Evans presided at the trial.

State charters were issued at Harrisburg recently to the following coal companies: **Allied Mining Companies**, mining coal and clay; Clearfield, capital, \$50,000; treasurer, Nena Jones Mahaffey. Incorporators: D. W. Walker, Nena Jones and J. Karl Vinson, Mahaffey. **Standard Coal Corporation**, Canonsburg, \$100,000; R. P. McClennan, Irwin. The company will engage in mining and preparing coal for the market.

Incorporators: R. P. McClennan and Fred E. Silveus, Irwin and James C. Greer, McKeesport.

Carl Scholz, vice-president of the Raleigh-Wyoming Coal Co., of Charleston, W. Va., in an address before the Engineers' Club at Philadelphia on June 12 declared that complete unionization of every coal field in the United States as a solution of the whole coal problem for which the miners' officials still are clamoring would be a calamity. He proposed the following solution: "Eliminate the interruptions of production and transportation, and the coal business will take care of itself, as it did for so many years when it grew so steadily and tremendously and aided in making this country the largest producer, not only of coal, but of other commodities depending upon the utilization of coal; make the union where it continues its activities responsible for the action of its officers and members; give the men the right to work that has been granted them by the Constitution; let them think of their families and home affairs, rather than to be influenced by the stranger, who has other motives in his mind, and the vexing question will be settled."

Auditor General Samuel S. Lewis announced at Harrisburg June 20 that he has started an examination of the books and operating officials of some of the anthracite companies in order to check up values of coal as reported to him for tax purposes and to standardize the work of making reports under the law. There is a marked difference between values returned in the anthracite reports and the receipts shown in the capital stock tax reports, he said. The Auditor General said that if the representatives of his department now in the anthracite fields are denied access to the books and records or should essential information be withheld he will have subpoenas issued.

The **Workmen's Compensation Board**, which has been unable to function recently owing to the fact that Paul W. Houck, acting chairman, was the only member, now consists of two members, and Governor Pinchot in appointing the second announced that a third, who will be chairman, will soon be named. Benjamin Jarrett, of Farrell, recently tendered his resignation as a member of the board, effective as of July 1, but as his term expired with the end of the session of the State Senate, he automatically went out of office June 14, the date of the close of the Legislature. Harry A. Mackey, Philadelphia, chairman of the board for some years, resigned last January. Governor Pinchot this week named Commissioner Houck and John L. Morrison, an editor of Greenville, as members of the board, their terms to run to the close of the next session of the Senate.

TENNESSEE

Resolutions calling upon officials of District No. 19 United Mine Workers to petition the International executive board of the union to take necessary steps for the calling of a strike in all the non-union mines of that district, were adopted June 1 at a meeting of union delegates in a conference held at Middlesboro.

TEXAS

The **Standard Coal Co.**, of San Antonio, has filed an amendment to its charter decreasing the capital stock from \$500,000 to \$300,000.

The **O. K. Lignite Co.**, of Garrison, has been organized to mine and market Texas lignite. The company owns considerable lignite lands near Garrison, in central Texas, and will develop this property. The company is capitalized at \$60,000, and the incorporators are C. W. Osborne, Dr. R. B. Little and D. H. Roherer.

The **Anderson County Coal Co.**, of Palestine, has sold its holdings of Texas lignite land in Anderson County to the **Ligol Chemical Co.**, of Houston. J. W. Crotty, of Houston, president of the chemical company, says his company will establish a large chemical plant in Anderson County and will extract chemicals from the output of the mines to be opened on the land his company has purchased.

WEST VIRGINIA

The **Pond Creek Pocahontas Coal Co.**, in which those formerly owning the Pond Creek Coal Co., acquired by Henry Ford and his associates, are interested, has begun the active work of developing about 3,000

acres of coal land in McDowell County. The contract for sinking two shafts for the company has been awarded to Major Don H. Blanks, formerly of Fairmont, but now connected with a large contracting firm in Greensburg, Pa.

Organization of the Crab Orchard Smokeless Coal Co. presages development of additional coal territory in the Winding Gulf region on quite an extensive scale, since this company has an authorized capital stock of \$200,000. Beckley, in the heart of the Gulf field, will be the headquarters for the new company, in which the following people are largely interested: L. C. Lilly, W. M. Hackworth, W. W. Hume, Ashton File, all of Beckley, and P. B. Rodgers, of Crab Orchard.

With the purchase of all the outstanding stock of the Morgantown Coal Co., ranking as one of the oldest wholesale coal concerns in Morgantown, by M. L. Taylor and R. Hugh Jarvis, the company has been re-organized and will immediately re-enter the active competitive field, having ceased operations more than a year ago. In the re-organization Mr. Taylor has been elected president, Hugh Jarvis vice-president, and Harry C. Owens, secretary. Not only does the company plan to re-enter the whole coal trade, but it also proposes to operate mines.

In severing his connection with the Pond Creek Coal Company, which was recently bought by the Fordson Coal Co., H. M. Ernst, who has been for a number of years assistant general manager of the company, has become identified with the Island Creek Pocahontas Coal Co., of which T. B. Davis, of New York, is president. Other officers in the company are J. D. Francis, of Huntington, vice-president; A. R. Beisel, of Logan, general manager. The Pond Creek Coal Co. formerly was owned by Mr. Davis and his associates, who operate the Island Creek Coal Co. in the Logan field. Mr. Ernst will have charge of the development of about 3,000 acres of coal land in McDowell County, near Coalwood. A contract has already been awarded for the sinking of two shafts.

An office has been opened by the Peoria Coal Co. in the Deveny Building at Fairmont, Charles McKivett having been appointed as local manager. Thomas Love and others are interested in the Peoria company.

The National Gas Coal Co., of Pittsburgh, Pa., has been authorized to surrender its charter and discontinue its corporate existence in West Virginia. The Deep Hollow Coal Co., of Coalburg, has been authorized to decrease its capital stock from \$50,000 to \$10,000.

There has been organized under the laws of West Virginia the Pawva Coal Co., which as its name implies will engage in the coal business in Pennsylvania and West Virginia. Headquarters of the new enterprise are at 712 First National Bank building, Pittsburgh, Pa. The company is capitalized at 1,000 shares without par value. Active in organizing this company were: Samuel A. Taylor, J. M. Taylor, George Paull, of Pittsburgh, Pa.; Charles F. Taylor and Denny I. Campfield, of Clarksburg.

Safety meetings were held at the southern West Virginia, Virginia and Kentucky operations of the Consolidation Coal Co. during the latter part of May. In all more than a thousand miners attended the meetings, which were held at Coalwood, Six and Coretta, W. Va.; at Alfredton and Coaldam, Va., and at Anchor and Warren, Ky. Joseph W. Reed, director, and Robert J. Lauder, assistant director of the safety department of the company conducted the meetings. Among the speakers were: R. M. Lambie, chief of the West Virginia Department of Mines; Franklin K. Day, general manager of the Pocahontas-New River Division of the company; R. F. Cole, assistant general superintendent, and Mr. Brandt, general outside foreman, all of Coalwood.

Men prominent in operating circles in Winding Gulf territory have organized a coal-mining supply company with a view to engaging in business on a large scale. The new company is capitalized at \$300,000. The principal office will be at Beckley, in the heart of the Winding Gulf field. Among those identified with the new concern are: Ernest Chilson, an official of the Raleigh Coal & Coke Co., of Raleigh; Thomas H. Wickham, Winding Gulf operator; Joseph A. Graft, Daniel Boone and Ashton File, of Beckley. The new concern will be known as the Daniel Boone Mining Machine Co.

UTAH

The Utah Fuel Co. has been allowed \$299,755 with interest for nearly five years

by the I. C. C. in connection with its claim of excessive charges against the railroads during the Federal administration. The overcharges cover a period from June 25 to Nov. 19, 1918, and involved 7,123 cars of slack switched at the company's property at Sunnyside. It was ruled that a charge of \$2.50 per car would have been reasonable, whereas \$6.69 was actually made.

WISCONSIN

The Consolidation Coal Co., which has heretofore carried on its operations in the Milwaukee field through the Milwaukee-Western Fuel Co., has opened an office at 843 South Canal St., Milwaukee.

WASHINGTON, D. C.

The Midland Coal Co. lost its claim for \$20,395 by the termination of a government contract on which it was to furnish coal to Camp Funston three years ago. The company claimed this amount on 20,000 tons of coal which the government did not take as the camp was abandoned and the Controller General of the Treasury Department ruled that the government had a right to cancel the contract and disallow the claim.

CANADA

Drilling operations in the Chelmsford Basin, a short distance northwest of Sudbury, Ont., have revealed the presence of a seam of coal about 6 ft. thick at a depth of 342 ft. Investigations of the coal deposits in this region are being carried on by the British & Colonial Coal Mines, Limited.

J. W. MacMahon has been appointed Canadian representative for the Bertha-Consumers Co. of Pittsburgh, with headquarters at 614 Grosvenor Avenue, Westmount, Montreal, Quebec. Mr. MacMahon was formerly assistant purchasing agent for the Canadian Explosives Co. of Montreal.

The Dominion Coal Co. has completed its new shaft at O'Neill's Point, near Bridgeport, C. B. It will be known as Dominion No. 1, and is 670 feet deep. The work of sinking the shaft was begun last November. It has a concrete rim of 30 to 40 ft. down to sea level and the timbering, which is of hard pine, was done in 36-ft. sections.

Coal operators of the Province of Alberta, and others interested in the business in western Canada, will hold a conference in Winnipeg this month to discuss the matter of the shipment of domestic coal from Alberta to Ontario. The governments of each of the prairie provinces will be represented and the chief dealers of Ontario will attend. Sir Henry Thornton, president of the C. N. R., is expected to be present.

Net profits of the Crow's Nest Pass Coal Co. for 1922 were \$213,959, as compared with \$341,938 for the previous year. Add to this the actual balance brought forward from the previous year of \$84,857, and, allowing for taxes, the sum left for appropriations was \$192,957. The company paid \$372,690 in dividends, leaving a debit balance of \$94,874 to be carried forward and be provided for in 1923. The decrease in profits is attributed to the five months' strike at the mines. The company's current assets were \$1,190,000 and current liabilities, \$395,768.

Recently a number of miners have come from Scotland and have obtained employment in the Scotia pits and the Glace Bay coal fields. The arrival of the miners, it is thought, will to some extent offset the emigration of Nova Scotia miners to the United States. There also are many Italians filtering into Cape Breton and seeking work in the mines of the British Empire Steel Corporation.

Sabotage at the coal mines in the Grand Lake districts is alleged in connection with fires that destroyed a shaft house at one of the mines and also two C. P. R. freight cars standing on the tracks. According to reports the trouble started at the Avon Coal Co.'s mines following the dismissal of two miners, and it was said that the difficulties are the reason for the visit there of E. McG. Quirk, of the federal department of Labor, Ottawa, who has been called in to make an investigation of conditions.

Thomas Graham, general superintendent of the Canadian Collieries (D), Ltd., was elected president of the British Columbia division of the Canadian Institute of Mining and Metallurgy at the annual meeting held May 14 at Vancouver. He is succeeding F. W. Guernsey, who asked to be relieved of

office and who was tendered a dinner. H. Mortimer Lamb, the secretary, in submitting his report suggested the establishment of a branch of the Institute at Stewart, Portland Canal. Amendments to the Professional Engineers' Act of British Columbia have been considered, but it was not thought well to touch that act at present. The standardization of examinations for coal-mine managers' certificates throughout the Dominion of Canada was a proposal upon which the parent body will be asked to act.

Association Activities

Officers elected by the Southwest Interstate Coal Operators' Association at the annual meeting in Kansas City, June 12, are as follows: Charles F. Spencer, Midway Coal Co., Pittsburg, Kan., president; George J. L. Wulff, Western Coal & Mining Co., St. Louis, Mo., vice-president at large; C. N. Fish, Home Riverside Coal Co., Leavenworth, Kan., secretary; George Manuel, Kansas City, Mo., assistant secretary; John M. Young, Greenwood Coal Co., Pittsburg, Kan., vice-president for Kansas; Isadore Pickering, Pickering Coal Co., Richmond, Mo., vice-president for Missouri; M. M. McWilliams, Clark-McWilliams Coal Co., Clarksville, Ark., vice-president for Arkansas; J. R. Crowe, Crowe Coal Co., Henryetta, Okla., vice-president for Oklahoma; W. L. A. Johnson, Kansas City, Mo., general commissioner; George Richardson, Pittsburg, Kan., commissioner, and Bernard Harrigan, Pittsburg, Kan., assistant commissioner of District 14; P. R. Stewart, Fort Smith, Ark., commissioner, and Joe Johnson, Henryetta, Okla., assistant commissioner of district 21 directors for Kansas, John A. Sargent, Central Coal & Coke Co., Kansas City, Mo.; Joseph Fletcher, Jackson Walker Coal & Mining Co., Pittsburg; W. C. Shank, Crowe Coal Co., Pittsburg, and Ira Clemens, Clemens Coal Co., Pittsburg; directors for Missouri, F. R. Atwill, Mercantile Coal Co., Richmond; C. J. Baxter, Big Creek Coal Co., Kirksville; E. J. McGrew, McGrew Coal Co., Lexington; directors for Oklahoma, J. R. Crowe, Henryetta; J. C. Reid, Cameron Coal Co., Williams; R. E. Lee, Rock Island Coal & Mining Co., Chicago; directors for Arkansas, M. M. McWilliams, Clarksville; R. A. Young, Greenwood, and J. G. Puterbaugh, McAlester Fuel Co., McAlester.

The Texas Retail Coal Dealers' Association at its annual convention held at Galveston on June 11 and 12 adopted resolutions advocating graduated seasonal-regional coal freight rates; to impress upon the public, individuals and corporations, the advisability of purchasing coal in the summer; to obtain the assistance of the U. S. Bureau of Domestic and Foreign Relations in a publicity campaign setting forth figures in relation to purchasing coal in the summer; to obtain repairs on cars before loading with coal; to obtain revocation of the order for loading to 10 per cent above marked capacity, issued by railroads and obeyed by mines; for strict observance by mines of the rule governing size of coals; for better preparation and prevention of slack being loaded with domestic or fancy sizes and for weighing of coal at point of destination or point nearest in line of transit. The association also went on record in favor of the buying of coal based on the price in effect at date of shipment, instead of date of purchase. The fulfillment of all contracts upon price at time which orders are accepted also was advocated. Elijah Cole, of Houston, was elected president; Harvey S. Tre-witt, Dallas, first vice-president; William N. Martin, Vernon, second vice-president, and Clarence R. Goldmann, Dallas, was re-elected secretary. The executive committee is composed of the following: Charles Fowler, Galveston, chairman; Lee M. Pool, Greenville; Tillman Bibb, Fort Worth; L. M. Bushnell, Waco, and the officers of the association.

Obituary

Francis Lockhart, 48 years old, formerly of Pittsburgh and Somerset, Pa., died June 17, in Fellsmere, Fla. Mr. Lockhart was formerly secretary of the Somerset County Coal Operators' Association, Somerset, Pa. He leaves his widow, Mrs. Ethel B. Lockhart of Pittsburgh; one sister, Mrs. George T. McCarty, and one brother, Floyd Lockhart.

Trade Literature

Sanation of Impaired Structures and Subterranean Waterproofing by Weber Intrusion Methods. Weber Engineering Corp., Singer Building, New York City. Pp. 8; 4 x 9 in. Especially applicable in safeguarding the excavation while driving mine shafts and in protecting the shaft from the contamination of the sulphur, alkalies and other impurities in the ground water.

Wood Pipe. Continental Pipe Mfg. Co., Seattle, Wash. Catalog No. 18. Pp. 248; 6 x 9 in.; illustrated. This well-arranged and profusely illustrated book describes Continental wire-wound wood pipe, continuous stave wood pipe and creowood flume.

Uniflow Improved Return Tubular Boilers. Lebanon Boiler Works, Philadelphia, Pa. Bulletin 23-A. Pp. 23; 3 x 6 in.; illustrated. This little book describes the advantages and savings of the "Uniflow" boilers.

American Airtight Door. The Conveyors Corporation of America, Chicago, Ill. Folder describing an airtight door, largely used in ash pits and boiler settings, made in five sizes: 15x16, 18x18, 22x26, 24x24 and 24x36 in. The door is strong and substantially built of cast iron. When closed and locked it is airtight.

Publications Received

"**Strikes and Lockouts, 1922**," is the title of an article in the June number of the *Labor Review*, giving statistics as to the number of strikes in each of the years from 1916 to 1922 inclusive for the country as a whole and by states, the principal causes of the strikes, the number of persons involved, the duration of such strikes and other interesting data. A tabulation is given as to the number of disputes in certain specified occupations for the years mentioned. It shows that in the occupation of coal mining there were 373 disputes in 1916; in 1917, 355; in 1918, 162; in 1919, 148; in 1920, 161; in 1921, 81, and in 1922, 440. While the number of strikes reported for 1922 was less than that for any of the six years preceding, the number of strikers exceeded those in each of the other years with but one exception, because of the coal and rail strikes of last year. The coal strikes involved about 600,000 men and the rail strike about 400,000 men.

The Department of the Interior announces the issuance of Technical Paper 333, "**Permissible Explosive, Mining Equipment and Apparatus Approved Prior to Jan. 1, 1923**," by the Bureau of Mines. It contains a table giving the brand names of all explosives now considered as permissible for use in dusty and gaseous coal mines, tested by the Bureau of Mines prior to Jan. 1, 1923. The list includes a total of 154 permissible explosives. In addition to permissible explosives, Technical Paper 133 includes lists of permissible explosion-proof coal drilling and short-wall mining equipment, permissible electric lamps, permissible flame safety lamps, permissible methane indicators, single-shot blasting units, storage-battery locomotives, mine-rescue breathing apparatus, and gas masks. Technical Paper 333 may be obtained from the Department of the Interior, Bureau of Mines, Washington, D. C.

Traffic News

Questions involved in the case of the **Colorado & New Mexico Coal Operators' Association versus the Denver & Rio Grande** will be discussed at an Interstate Commerce Commission hearing in Denver on Sept. 10. Commissioner Hall will attend the hearing.

Only twice within the history of the Chesapeake & Ohio R.R. have the monthly coal loadings on that road been as large as they were during the month of May, 1923, when over 3,000,000 tons was handled by the road.

The **Chesapeake & Ohio Railway Co.** has been authorized by the Interstate Commerce Commission to assume liability for \$371,000 worth of **Elkhorn Piney Coal Mining Co.** car trust certificates.

The **New York Central R.R.** has been authorized by the Interstate Commerce Com-

mission to issue equipment trust certificates in the amount of \$17,340,000 to be dated June 1, 1923, proceeds of which will be used in the purchase of additional new equipment.

Combination rates on bituminous coal over the Baltimore & Ohio and Pennsylvania from mines on the Baltimore & Ohio in West Virginia to Trenton, N. J., have been found not to be unreasonable. The Interstate Commerce Commission has denied a plea for the establishment of joint rates on such movement.

Revised freight rates on shipments within Colorado went into effect June 19, over the protests of the railroad companies. The changes are many, providing reductions of from 10 to 25 per cent. These are rate changes ordered by the Colorado Public Utilities Commission and have no relation to the sweeping changes in coal rates between Rocky Mountain states and the West and Northwest, issued at Washington by the I.C.C. June 22 to become effective in ninety days.

A new railroad being constructed by the Haskell interests from Caspar, Wyo., to Miles City, Mont., will make accessible extensive coal deposits. This line of railroad, while only 330 miles in length, is of unusual significance, since it furnishes a connection between the Union Pacific, the Northwestern, the Chicago, Burlington & Quincy, the Northern Pacific and the Chicago, Milwaukee & St. Paul. No such similar tie exists, except 600 miles away toward the east.

The **New York, Ontario & Western R.R.**, according to its annual report, in 1922 carried over its lines coal valued at \$3,652,149.15, as compared with \$5,498,964.11 in 1921. It holds \$2,400,000 worth of first mortgage bonds of the Elk Hill Coal & Iron Co. and \$1,153,000 first mortgage bonds of the Scranton Coal Co. John B. Kerr, president, says in his report that the net loss in gross earnings from coal transportation due to the strike was over \$1,800,000 as compared with the preceding year, while the net loss in gross and net earnings by rate reductions on traffic was over \$300,000. Coal consumed during the year was 16,926 tons of anthracite and 278,040 tons of bituminous, compared with 38,900 tons of anthracite and 250,843 tons of bituminous in 1921. The cost of fuel per engine mile was 40.93c. in 1922 as compared with 36.96c. in 1921.

A total of 9,876 new freight cars were placed in service by railroads between May 15 and June 1, according to the Car Service Division of the American Railway Association. This brought the total number of new freight cars installed in service from Jan. 1, 1923, to June 1, to 65,660. Of the new cars placed in service during the first five months this year, 26,806 were coal cars. The railroads on June 1 also had on order 107,079 new freight cars, deliveries of which are being made daily. A total of 161 new locomotives also were placed in service from May 15 to June 1, which brought the total installed from Jan. 1, 1923, to June 1, to 1,697. The railroads also had 2,041 new locomotives on order June 1.

Rates on fine coal from producing points in Illinois, Indiana and western Kentucky to Sioux Falls, S. D., have been found by the Interstate Commerce Commission to be unduly prejudicial to Sioux Falls and unduly preferential to Sioux City. The rates on fine coal, the commission finds, should not exceed the contemporaneous rates to Sioux City by a greater percentage than the rates on lump coal to Sioux Falls exceed rates on lump coal to Sioux City from the same points of origin. Commissioner McChord dissented from the opinion of the majority on the ground that the lower value of fine coal and the lower terminal expenses incident to the movement to Sioux Falls do not justify the concessions reached by the majority.

The **Northern States Power Co.**, a large consumer of coal in the Northwest, intervening in the Northwestern Coal Dock Operators' Association case, urges that nothing be done to break up fair competition among those who sell coal in the Northwest. The power company advises the Interstate Commerce Commission that the inability of the Northwestern docks to move a full tonnage of coal during recent years has been due almost entirely to abnormal conditions rather than to any freight-rate discrimination. The present freight rate adjustment is fairly equitable in providing a basis for active competition, the power company declares. During the year just ended, it says, the docks, with a limited tonnage of high-price coal, were not in a position to compete with southern Illinois

upon any reasonable freight-rate adjustment. The power company urges that no ket by the dock operators under normal conditions be recommended until operations under normal conditions over a representative period be tried out. To have a rate adjustment which would have enabled the docks to compete during abnormal times would mean the entire control of the market. The power company is careful to point out that the Lake Superior docks constitute a valuable reservoir for the storage of a large summer movement of coal and that they are a great protection and convenience, but that sight must not be lost of the value of southern Illinois in maintaining competitive conditions.

Freight-car performance statistics for April, compiled by the Bureau of Railway Economics, show that the average daily movement per freight car during that month was the greatest for any month since the autumn of 1920 when freight traffic was especially heavy. The daily average for the month was 28 miles, an increase of one mile over that for March, 6 7/10 miles over the average for April last year and 7 4/10 miles over the average for the same month in 1921. Compilations show that the average load per car in April was 27.6 tons. This was three-tenths of a ton less than the average for March, but an increase of 3 1/5 tons over the average for April last year. Except for April, 1918, when the average was 29.8 tons, and April, 1920, when it was 28.6 tons, the average for April this year was the heaviest for any April since tabulations of these records began in 1917.

Coming Meetings

Oklahoma Coal Operators' Association will hold its annual meeting Sept. 13 at McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

Rocky Mountain Coal Mining Institute will hold its summer meeting Aug. 27 to 29 at Salt Lake City, Utah, in conjunction with the **International Safety and First-Aid Meet.** Secretary, Benedict Shubart, Denver, Colo.

Iron and Steel Exposition at Buffalo, N. Y., Sept. 24-28. Association of Iron and Steel Electrical Engineers, Empire Building, Pittsburgh, Pa.

National Safety Council will hold its twelfth annual safety convention at the Buffalo Statler Hotel, Buffalo, N. Y., Oct. 1-5. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

International First-Aid and Mine Rescue meet will be held Aug. 27-29, at Salt Lake City, Utah.

The American Institute of Mining and Metallurgical Engineers has accepted the invitation extended by the Ministers of Mines of Ontario and Quebec and by the Canadian Institute of Mining and Metallurgy to hold its autumn meeting in Canada. The meeting will start Aug. 20 at Toronto and end Aug. 30 at Montreal. Secretary, F. F. Sharpless, 29 West 39th Street, New York City.

Coal Mining Institute of America will hold its annual meeting Dec. 19, 20 and 21 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Chamber of Commerce Building, Pittsburgh, Pa.

The American Mining Congress will hold its twenty-sixth annual convention in conjunction with the **National Exposition of Mines and Mining Equipment**, Sept. 24-29, at the Milwaukee Auditorium, Milwaukee, Wis. Secretary, J. F. Callbreath, Washington, D. C.

Ninth National Exposition of Chemical Industries at the Grand Central Palace, New York City, week of Sept. 17. Manager, Charles F. Roth, Grand Central Palace, New York City.

Mine Inspectors' Institute of America will hold its 13th annual meeting July 10-12 at Pittsburgh, Pa. Secretary, J. W. Paul, 4800 Forbes St., Pittsburgh, Pa.

Ontario Mining Association will hold its annual meeting July 5 at Kirkland Lake, Ont., Can. Secretary, B. Neilly, Toronto, Ont., Can.

New York State Coal Merchants' Association will hold its annual convention on Sept. 10-12 at Sacandaga Park, N. Y. Executive secretary, G. W. F. Woodside, 250 Arkay Building, Albany, N. Y.

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Biggest of Our National Government's Coal Mines—Its History, Coal Seams and Operation 1037

BY SUMNER S. SMITH.

MINE OPENED BY GOLD-MINE OWNER—Coal first shipped by sled—Faults drove out private capital—Coal good but thin—Labor \$4.50 per day and up—Mine cost \$6.50 per ton—Operation profitable.

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BY FRANK HAAS.

Too MUCH SPENT on some mines for maximum of profit—Must consider not only net earnings but what sums of money would earn annuities equal to the several net earnings.

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It Seems Quite Likely

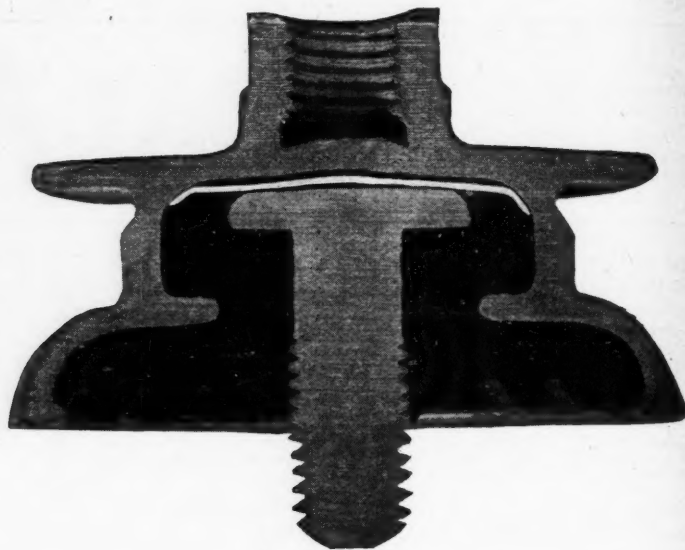
that a few years from now we shall not be using any raw coal under boilers, but every large mine operation will have its own coal-distilling plant and will sell coke, gas and byproducts instead of coal, or perhaps will generate electric power at the mines with the surplus gas. Consequently what is being done at the coke and byproduct plant of the Cambria Steel Co. will be interesting to all our readers, and next week *Coal Age* will publish a story on the subject as written by G. A. Richardson.

Extinction of a Mine Fire

Shallow mine fires last for months and years. They often get entirely beyond restraint. The danger of a shallow mine fire is in its partly going out. It cools down and draws in air, and the air sets it going again. But if the draught were only incombustible gas, the product of an earlier combustion, the fire would not revive. This was proved at a big fire in a coke-region mine. One wonders, if it had been tried earlier, whether it might not have saved Carbondale from its continuous pall of smoke and the Lehigh Coal & Navigation Co. from a million dollars of expenditure at the Summit Hill fire. Instead of a great excavation costing an immense sum of money a giant "soda" might serve to extinguish the Red Ash fire.

Dynamic Braking

Mr. Gealy in next week's issue will have an article on electric braking and its place in the operation of mine transportation, especially where a locomotive makes many stops.

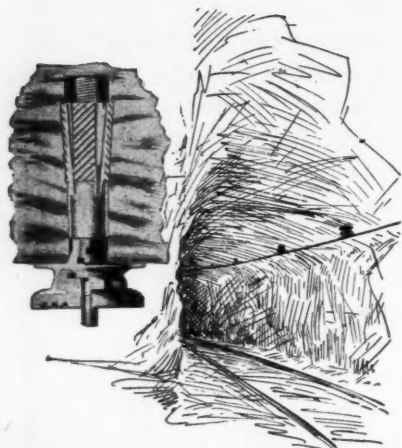


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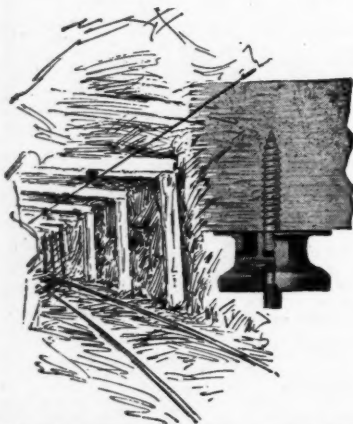
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Type K-3 Hanger with threaded boss to give minimum roof clearance. Insulated with Dirigo, the moisture and time proof insulation.



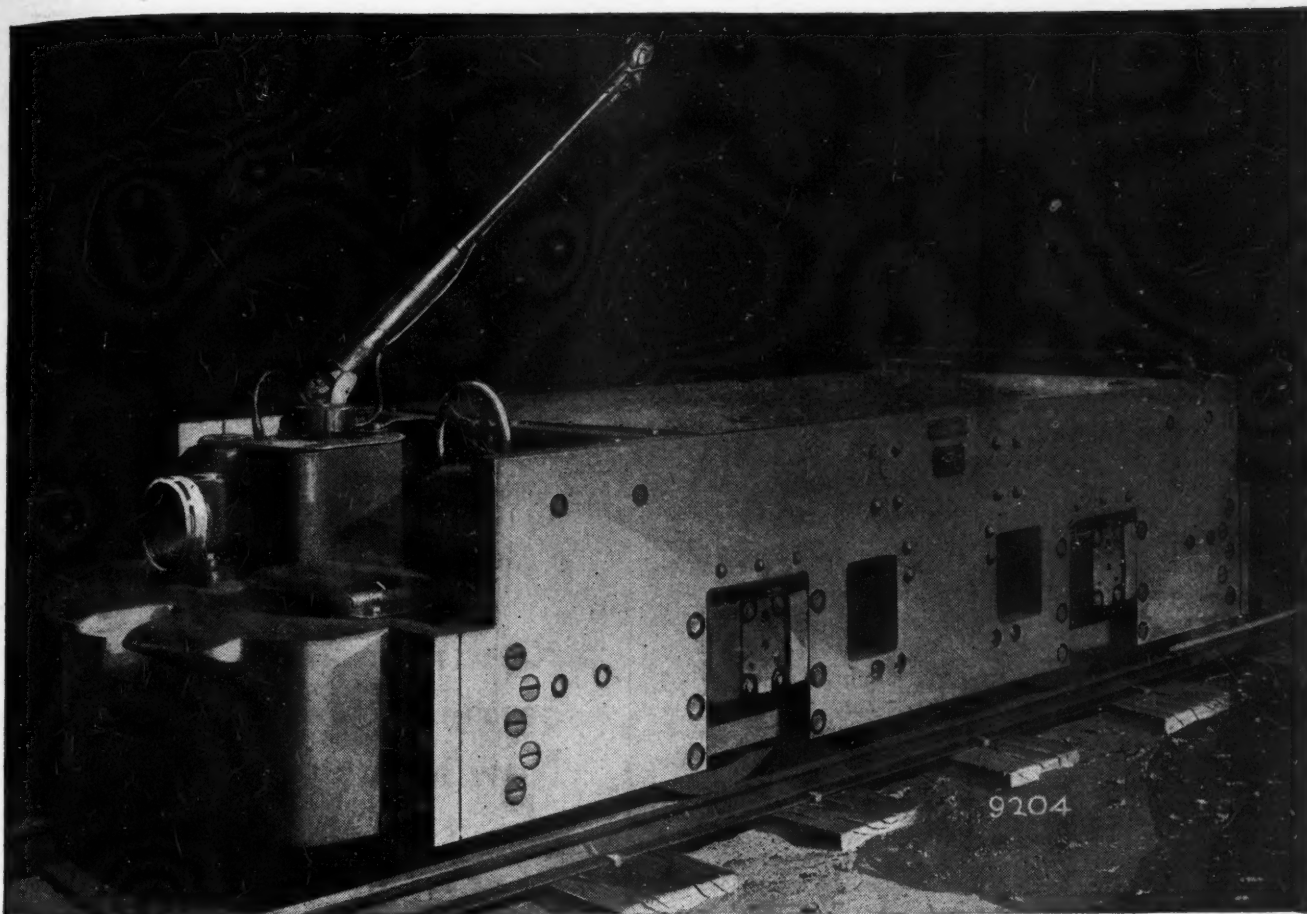
Universal-1 Hanger. Has a broad roof bearing surface desirable in curve work. Multiple petticoats in insulation prevent surface leakage.

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The Low Ash Coal Co., Excelsior, Bell County, Kentucky. Chas. Janeway, Mine Foreman says:—"Our Jeffrey Locomotive has been in service for fifteen years. The gears and pinions, wiring, field and armature are in good shape. We are well pleased with the work of our Jeffrey Locomotive and are dependent on it for our production. It has never failed us."

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Story of an Eye Witness—Pile of Creosoted
Mine Timber Fired by Spark from Loco-
motive—Water Failed to Extinguish Fire

... I was running a mine hoist, at one of the large shaft mines here in Nanticoke. The company had a creosoting plant at one of their other mines and had sent over two flat cars loaded with mine timber that had been treated with creosote. ...

When I came out in the evening, ready for the night-shift, I observed the small locomotive coming up the track. Just then a signal for lowering men called me to the throttle. ...

Returning to the doorway, a few minutes later, what was my surprise to behold a volume of smoke coming from the pile of timber. Evidently, the fire had caught from a spark or hot coal falling from the engine. Without seeing it, one would hardly believe the volume of dense smoke that was given off from the burning pile. It resembled the discharge from two big locomotives pulling a heavy trip of cars up a mountain grade.

The alarm was quickly given, but water appeared to have no effect to extinguish the fire. ...

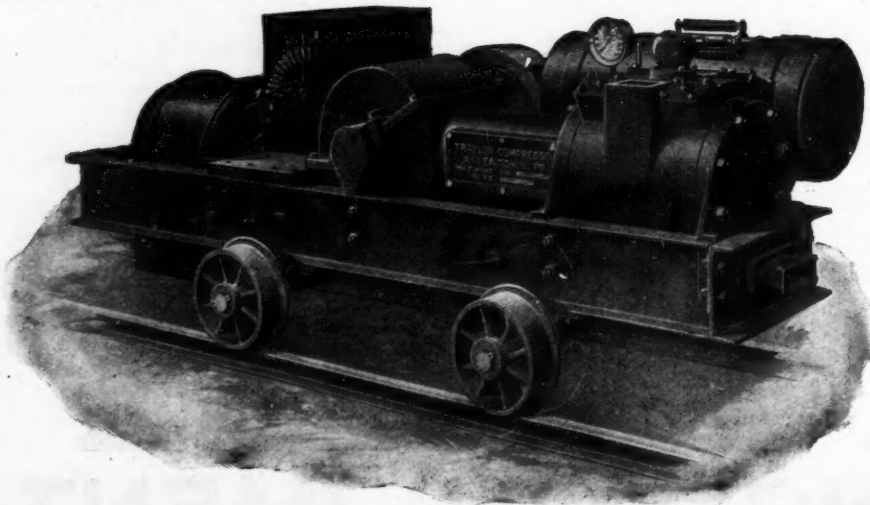
The following morning, the mine superintendent was early on hand to view the place. I remarked to him that had the timber been ignited in the mine, not a man or animal inside of the burning section would have been able to escape through the dense volumes of smoke produced by the burning timber. He agreed with me and put himself on record then and there against the use of creosoted timber in the mine.

In closing, allow me to suggest that the use of the "Cement-Gun" and the coating of mine timbers with "Gunite" is of far greater practical value as a preservative of timber and is not a menace to the safety of the mine. I hope this brief account may be of some value in averting disaster.

Nanticoke, Pa.

W. A. BARRETT.

See Coal Age, May 24, Page 862 for entire letter



for Fireproofing Timbering

Read the story—it
carries its own moral!
Now let us tell you more
about the use of "GUNITE,"
applied by the
"Cement-Gun"

And ask us about this Compressor.

This one is the Traylor motor-driven MINE TYPE. No kicks or quakes. Runs so free from vibration it needs no blocking on the rails. For any pneumatic work. Straight line. Slow speed. Worm gears. Two sizes—9 x 8 and 13 x 8. Bulletin 104.

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The new Model 300 Turbro Waughoist is in the "AA" Class. Here are the figures:

Air pressure recommended at hoist, 50 lbs.
 Average horsepower developed at 50-lbs. pressure, 10 hp.
 Maximum horsepower developed at 50-lbs. pressure, 13.5 hp.
 Rope speed, 1600-lb. rope-pull—50-lbs. pressure, 295 ft. per min.
 Rope speed, 1800-lb. rope-pull—50-lbs. pressure, 235 ft. per min.
 Rope speed, 2000-lb. rope-pull—50-lbs. pressure, 178 ft. per min.
 Rope speed, 2200-lb. rope-pull—50-lbs. pressure, 118 ft. per min.

Before buying a hoist for scraping, lifting, or pulling, compare the ratings. We'll be glad to send you our new 300 bulletin. Ask the nearest Waugh branch office for a copy today.

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Duluth

Joplin
Wallace
Salt Lake City
Pittsburgh

Lima
Santiago
Butte

New York
Houghton
Birmingham

Melbourne
Mexico City
Pottsville

Canadian Rock Drill Company, Limited

Sole Agents in Canada

Montreal, Quebec

Cobalt, Ont.

Nelson, B. C.

Vancouver, B. C.

The Denver Rock Drill & Machinery Company, Limited

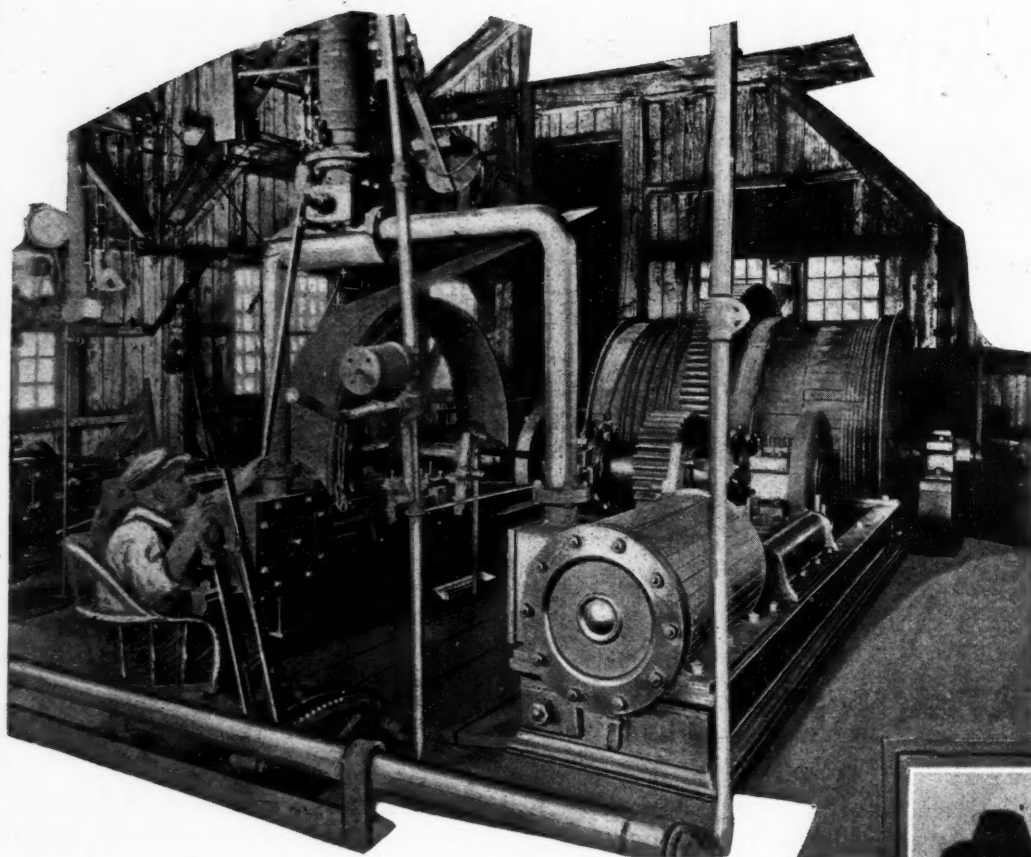
Sole Agents in South Africa and Rhodesia

Southern Life Building, Johannesburg, Transvaal, South Africa.

Andrews & George Company, Sole Agents in Japan, Tokyo, Japan

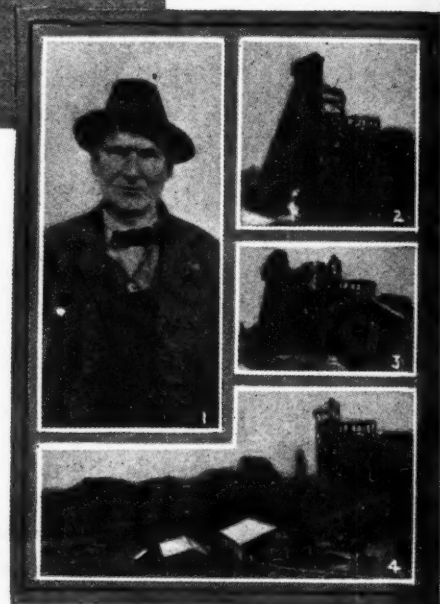
Get Preferred Attention—Mention Coal Age in Writing Advertisers

Tom Langan a



12,000,000 tons
of material hoisted

cage travel—
13½ times around
the globe



No. 1. Thomas Langan, Hoisting Engineer, Seneca Colliery. No. 2. The breaker tower just before operations were stopped. No. 3. How the tower was razed by dynamiting its foundations. No. 4. Dust arising from fallen tower.

and his Veteran Vulcan— Team-mates for 33 years!

June 18th, 1888, when the old Seneca Breaker of the Lehigh Valley Coal Company first started to operate, Tom Langan, Hoist Engineer, was put in charge of a steam-operated Vulcan.

Tom and his Vulcan stayed on the job, continuously for 33 years—up until the old breaker was razed.

Still good for more service

The fact that the original Vulcan Hoist, with practically all parts intact as installed, were still good for more service when the breaker was shut down, speaks well for both the equipment and the efficient care of the operator.

The original crank pin, wrist pin and cross-head shoe brasses were still in use when operations stopped. The cylinders were never rebored and were in fine condition after 33 years' continuous service.

Cage travel—13½ times around the Globe

The tonnage handled by this Vulcan during its 33-year service was approximately 8,500,000 tons of coal; and about 12,000,000 tons of total material, including boiler fuel and refuse—or 6,000,000 hoists. Figuring 225 feet of travel of the cage per hoist, the cages traveled 340,000 miles—about 13½ times around the earth.

Thus the story of Vulcan equipment made over 33 years ago.

We've been bettering our Hoists ever since

Ever since this Veteran Vulcan Hoist was installed, we have been bettering the material and design of both our steam and electric Hoisting Equipment. From the standpoint of durability, ease and speed of operation—and safety—the modern Vulcan is—needless to say—unsurpassed.

Small wonder that the demand for Vulcan Hoisting Equipment has been steadily increasing in mines throughout the country.

Get in touch with us

A complete description of Vulcan Hoists or other equipment, with a list of enthusiastic users, will be sent you by return mail.

VULCAN IRON WORKS

Established 1849

1730 Main Street, Wilkes-Barre, Pa.

Other Vulcan Equipment

Steam Locomotives
Gasoline Locomotives
Rotary Kilns, Dryers,
Coolers and Roasters
Mine Ventilating Fans
Cages and Skips
Sheave Wheels

Corliss Engines
Coal Crushers and Rolls
Gray Iron Castings
Open Hearth Steel Castings
Gears, Moulded and Cut
Teeth
Special Machinery

VULCAN OF WILKES-BARRE HOISTS

Get Preferred Attention—Mention Coal Age in Writing Advertisers



The Shriek of Araby

Out of the warm dark portal of the mine and into the blinding sunlight emerged Foreman Hodges, blinking his eyes while knocking the carbide from his lamp with one hand and shaking his cap with the other to dislodge a piece of fungus gathered from the wet timbers just inside.

He hailed the Superintendent beneath the tipple where the last car of the day was being topped preparatory to being sent down the siding to compose a part of the "out" train in the morning.

"I ran into the machine runners going on this A.M.," he began, "and they sure climbed my hide for a fare-you-well.

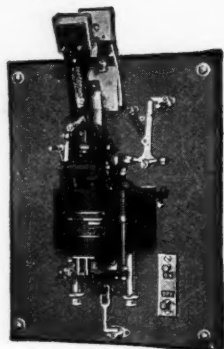
"That cutter, Tony Araby, knows too much for the rest of them. Got 'em all steamed up to perfection. The boys were mad, that's all."

"How was that Hodges", the Boss queried.

"Well, you know those fellows are on a yardage basis and get to work just as soon in the evening as they can. Try to get all their places cut and then 'partie' for home 'toot sweet.' We don't keep anyone in the substation at night and when the breaker pops they take

turns walking outside and putting it back in.

"Appears like last night was a mean one on all hands. So much time was lost that they didn't get out until time for the loaders to come out this morning, and then none had all his rooms cut.



The Circuit Breaker with Brains

"Tony is wise, though—older and been around a bit more—and knows how the trouble can be corrected. He tells the others and the whole gang sand-bags me this morning.

"Araby led the cheers and shrieks

though, for the rest of the bunch and they practically issued an ultimatum that if something wasn't done shortly, they were going where they could get their work done and make some faster jack.

"Really a bad situation, 'Chief,' " the foreman continued.

"Araby is the best cutter on the job and I'd hate to see him leave. He isn't asking for anything unreasonable, either. What is his profit is ours also, and that doesn't include a muchly needed better voltage at the machines.

"Says we ought to have automatic reclosing circuit breakers inside so that when one of them threw an overload or 'short' on the line it wouldn't effect the rest, too."

"Hodges," cut in the Super, "sorry to interrupt your account, but you tell Tony and his crowd that I had a representative of the Automatic Reclosing Circuit Breaker Co. here today going over our layout, and I've placed an order for eight of them.

"The only mistake we made was in not listening to the shrieks of Araby months ago. Tony's all right."

THE AUTOMATIC RECLOSING CIRCUIT BREAKER CO.

COLUMBUS, OHIO, U. S. A.

DISTRICT SALES OFFICES:

PITTSBURGH: 223 Oliver Bldg.

CHARLESTON, W. VA.: 317-318 Moore Bldg.

WILKES-BARRE, PA.: 806 Miner's Bk. Bldg.

ST. LOUIS: 401 National Bank of Commerce Bldg.

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Cut Your Coal With



Alternating Current Ironclads

One of 48 Sullivan A.C.
"Ironclads" owned by
Nokomis Coal Co., Illinois.

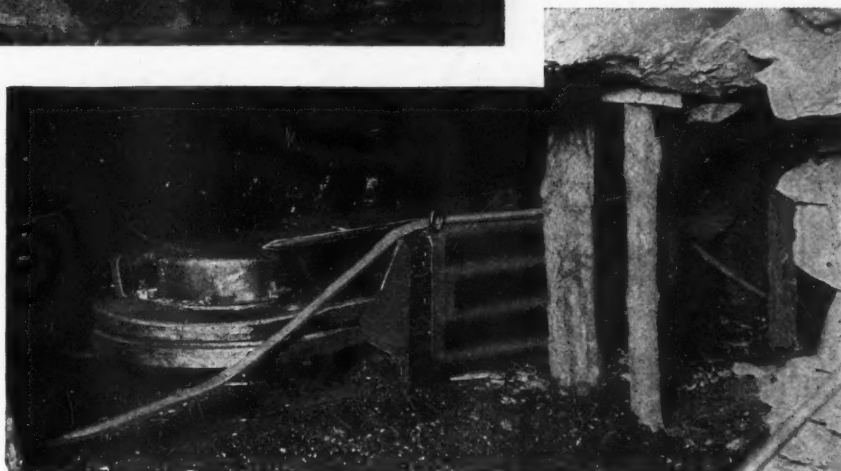
Below, Sullivan Longwall
Ironclad, A.C. type, La Salle
County Carbon Coal Co.,
La Salle, Ill.

Are You Opening a Mine?

*Don't wait for a
power plant—*

Hook a transformer to the nearest transmission line, wire your entries as they advance and start production at once with one or two Sullivan "A.C." Ironclad Mining Machines. They are fast and handy for entries and narrow work.

When your direct current plant is in, save it for haulage and keep on cutting coal with A.C. Ironclads. This method will obviate low voltage at the machines, which often results when the same feed wires are used to supply cutters and locomotives.



Where difficult cutting is encountered, A.C. Ironclads will get out the tonnage when other types stall and stop working. A.C. Ironclads are built for room and pillar and for longwall mining. They will cut in either direction, can be equipped with cutter bars up to 10 feet (for room mining), and possess all other mechanical advantages of the direct-current Ironclads.

Ask for "Ironclad" Catalogue No. 79-DC

DOMESTIC SALES OFFICES

Birmingham, Boston,
Butte, Claremont,
N. H., Cleveland, Dal-
las, Denver, Duluth,
El Paso, Huntington,
W. Va., Joplin, Jun-
eau, Knoxville, New
York, Pittsburgh,
St. Louis, Salt Lake,
San Francisco
Spokane.

COMPRESSORS AIR LIFT DIAMOND DRILLS SHARPENERS FORGES
FORGE HAMMERS COAL CUTTERS ROCK DRILLS DRILLING CONTRACTORS

SULLIVAN
MACHINERY COMPANY
134 So. Michigan Ave. Chicago.

FOREIGN SALES OFFICES

Algiers, Brussels,
Calcutta, Christiania,
Durban, Natal, Hava-
na, Lima, London,
Madrid, Mexico City,
Paris, San Juan, San-
tiago, Shanghai, Syd-
ney, N. S. W., Tokyo,
Toronto, Tunis,
Turin, Vancouver.

Get Preferred Attention—Mention Coal Age in Writing Advertisers



Getting the best price for your coal

Do you know that you can eliminate your coal breakage by use of a Webster Loading Boom?

Webster Loading Booms lay (not drop) the coal in the railroad cars, thus insuring a better grade which demands the highest market price.

The horizontal section of the boom in the tippleshed is designed to permit thorough picking while the lump travels away from the screens. The Boom Hoist is of rugged construction, permitting of continuous and dependable service.

Let Webster Engineers give you the benefit of their experience.

WEBSTER EQUIPMENT FOR THE COAL TIPPLE

Car Dumps, Car Hauls, Car Retarders, Screens, Feeders, Loading Booms,
Picking Tables, Crushers, Weigh Baskets, All Types of Elevators, Conveyors, Etc.

THE WEBSTER MFG. COMPANY

4500-4560 Cortland Street, CHICAGO

Branch Offices

BOSTON.....902 Oliver Bldg.
BUFFALO.....572 Ellicott Square
CINCINNATI.....1914 Union Central Bldg.
CLEVELAND.....509 Swetland Bldg.
NEW YORK.....90 West Street
PHILADELPHIA...719 Commercial Trust Bldg.

Factories

CHICAGO, ILLINOIS TIFFIN, OHIO

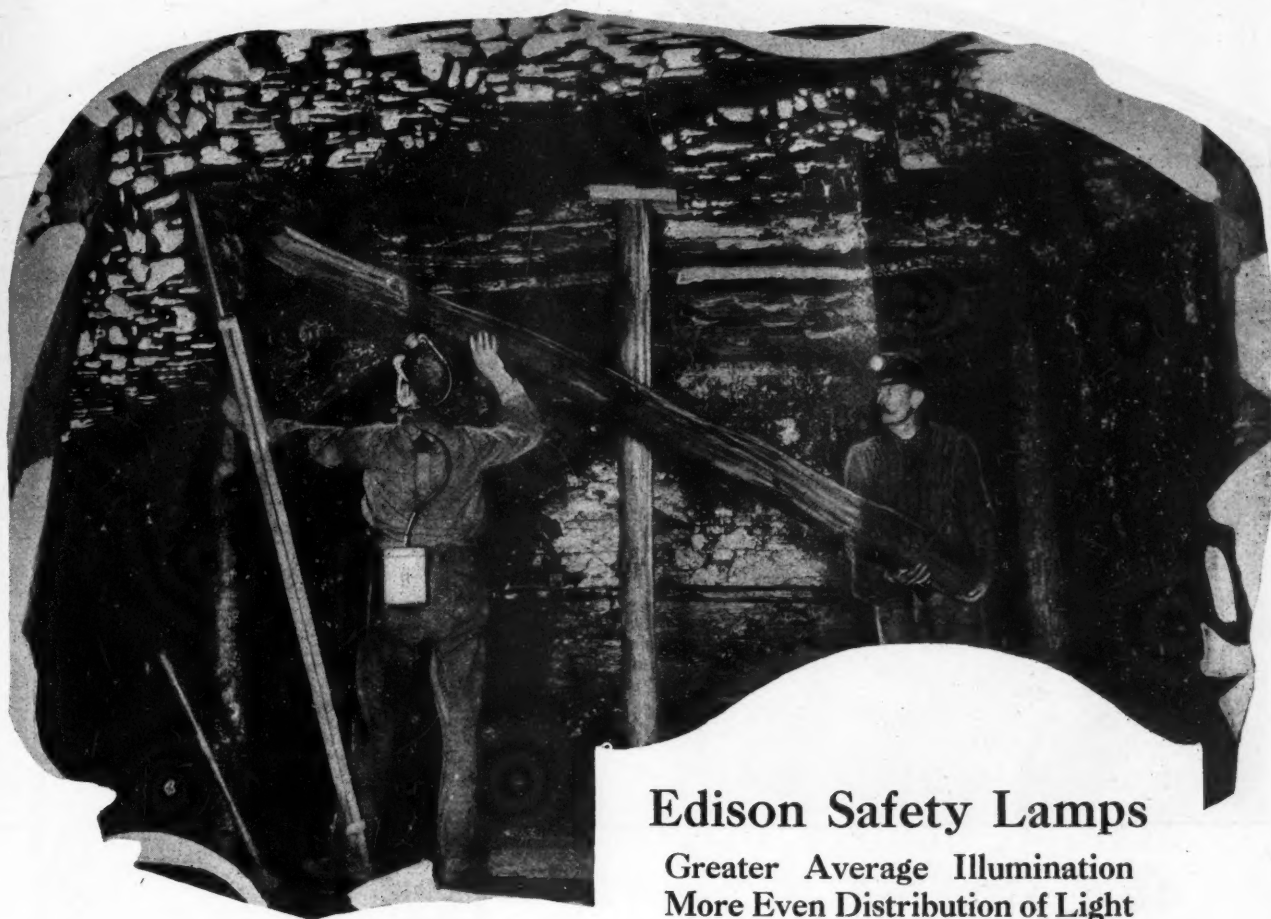
Agencies and Representatives

Atlanta, Ga.....Fulton Supply Co., 70 Nelson St.
Baltimore, Md..H. W. Faunt LeRoy, 523 Calvert Bldg.
Birmingham, Ala..G. R. Mueller, Brown-Marx Bldg.
Chattanooga, Tenn. Nixon-Hasselle Co., 703 James Bldg.
Denver, Colo.....C. L. Dean, 1718 California Ave.
Detroit, Mich., Palmer-Bee Co., 2778-2794 E. Grand Blvd.
Knoxville, Tenn...Webster & Co., Holston Bank Bldg.
Louisville, Ky...E. D. Morton & Co., 516 W. Main St.
Milwaukee, Wis....W. Claumann Co., 620 Wells Bldg.

New Orleans, La., Globe Supply & Machinery Company,
625-627 S. Peters Street.
Pittsburgh, Pa...Dempsy-Degener Co., 708 Penn Ave.
Salt Lake City, Utah, L. W. Mendenhall, 517 McIntyre
Building.
Salt Lake City, Utah.....Gallagher Machinery Co.
Seattle, Wash., The Brinkley Company, 651 Alaska St.
Vancouver, B. C...B. C. Equipment Company, Ltd.,
613 Bank of Nova Scotia Bldg.

Canadian Factory - Sales Office: WEBSTER-INGLIS, LIMITED, 14 Strachan Ave., Toronto, Ont.

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Edison Safety Lamps

Greater Average Illumination
More Even Distribution of Light

More than 200,000 Edison Electric
Safety Mine Lamps in more than 1,000
mines are proving that they are

Safe—Powerful—Dependable—
Economical

A miner wearing an Edison Safety
Mine Lamp can get more work done—
he does not have to stop every few
hours to fix his lamp.

The sturdy construction of the Edison
Battery—All-Steel with steel-preserv-
ing Alkaline solution—explains why
the Edison Mine Lamp has ruggedness,
long life and dependability.

Bulletin 300 will tell you how Edison
Mine Lamps will handle safely and
successfully your mine lighting
problem. Your copy on request.

Edison Safety Mine Lamps are distributed by

Mine Safety  *Appliances Co.*
Chamber of Commerce Bldg. Pittsburgh, Pa.

EDISON Safety Mine Lamp

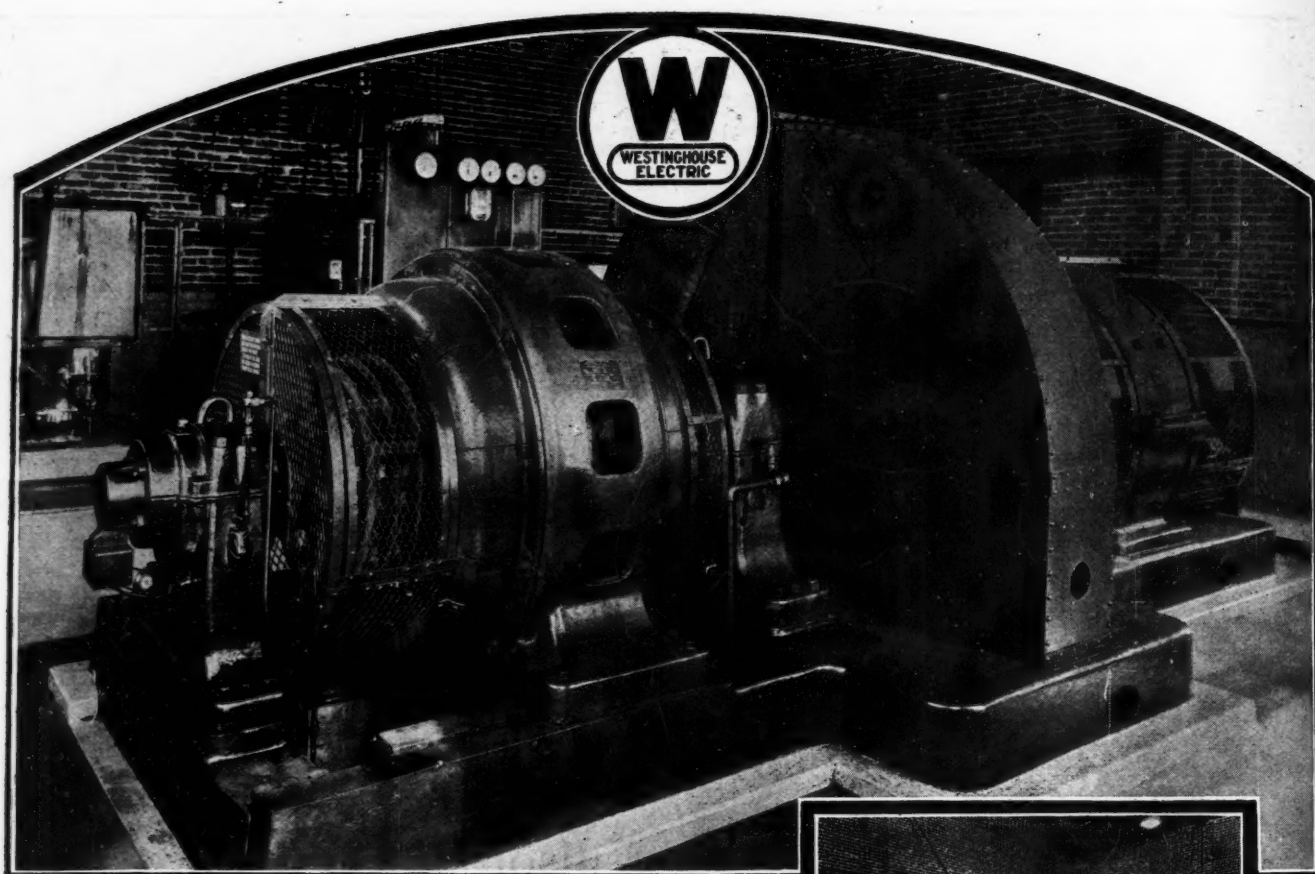


The battery used in this lamp has the same
rugged strength as the Edison batteries used in
Mine Locomotives.

Edison Storage Battery Co.

Orange, N. J.

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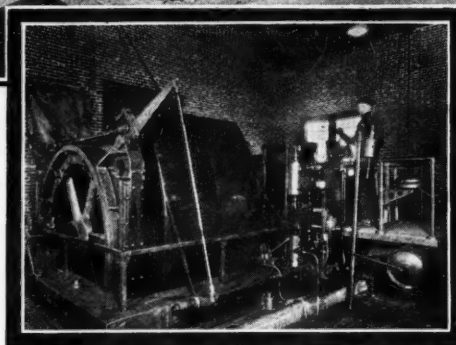
Standardized

It takes years of experience to enable a manufacturer to standardize his equipment—and particularly the electrical equipment employed under the varying requirements of mine hoist service.

This Westinghouse has been able to do, so that today—as a result of many years' experience in design and application—you are enabled to take advantage of the benefits of standardization in Westinghouse mine hoist equipment.

The qualities chiefly sought for by Westinghouse engineers in this standardization have been, first, reliability, and second, economy of operation.

This is attested to by the hundreds of successful Westinghouse installations throughout the mining fields.



800 hp. Westinghouse
Flywheel Hoisting Equipment,
Pittsburgh Terminal Coal Co.

Westinghouse
Electric & Manufacturing Company
East Pittsburgh, Pa.
Sales Offices in All Principal
American Cities

Westinghouse

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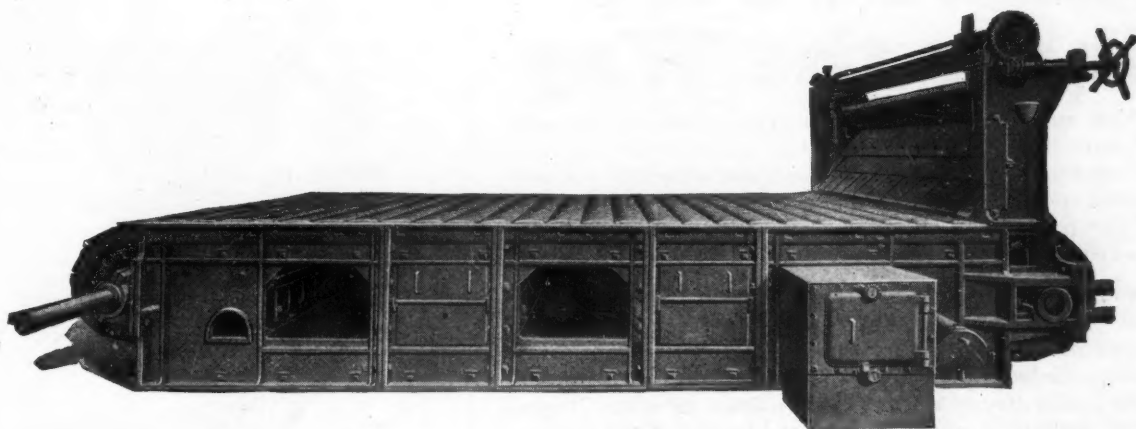
A WIDER FUEL MARKET

COXE STOKERS

Are burning coals today that a few years ago were classed as refuse.

This has increased the fuel market of hundreds of plants. It has resulted in greatly reduced coal bills.

The record of Coxe Stoker performance is of interest and value to anyone considering stoker equipment. We will be glad to mail Bulletin C. B. 1 showing the result of 26 tests with bituminous coals.



INTERNATIONAL COMBUSTION ENGINEERING CORPORATION

Combustion Engineering Corporation

Combustion Engineering Bldg. — 43 Broad Street New York City

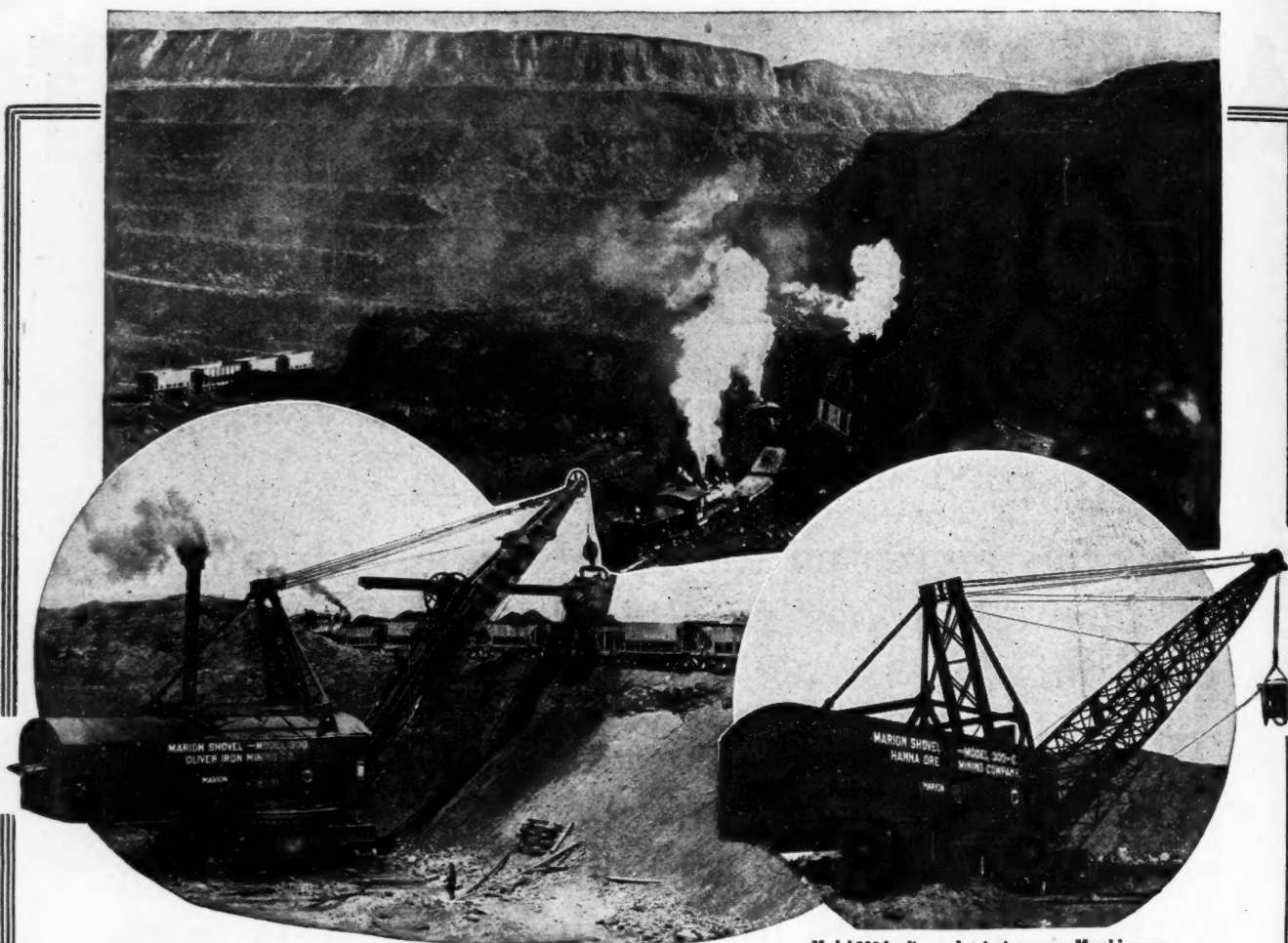
Offices in Principal Cities Throughout the World

Frederick Multiple Retort Stokers
Type E Stokers
Type D Stokers
Type K Stokers
Type H Stokers
Self-Contained Stokers

Green Chain Grate Stokers
Green Cast Iron Hoppers
Green Pressure Waterbacks
Quinn Fuel Oil Equipment

Lopulco Pulverized Fuel System
Coxe Stokers
Grieve Grates
Air Heaters
CEC Tube Scraping Device
Combustion Water Seal Conveyors

Get Preferred Attention—Mention Coal Age in Writing Advertisers



Model 300 loading and stripping ore on Mesabi range. Shovel and Dragline are interchangeable.

"Marions" Show the Way

FOR more than a third of a century Marion Shovels have been a dominant factor in mining, quarrying and excavating. They have definitely and accurately pointed the way to better methods, quicker work, larger production and greater profits. They have truly kept pace with all the requirements of the industry.

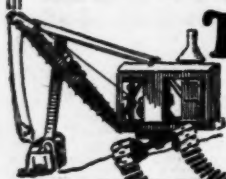
As pioneer and leader, the dependable Marion always wins. Large "Marion" Revolving Shovels and Draglines remove the overburden and handle "big-scale" digging and loading. Railway-type Shovels—now furnished with crawler trucks—take care of work in close quarters or where "high-speed" loading is required. Smaller Marions of full revolving type have wide adaptability for general utility work, handling most any kind of stripping, loading or grading.

Illustrations show typical types of latest Marion models. Our new designs provide for steam, gasoline or electric power, with optional mountings suited to all classes of excavating work. Bulletins are available on each type.



Small Revolving Shovel on Crawler Trucks. Readily convertible into dragline, clamshell or orangepeel excavator.

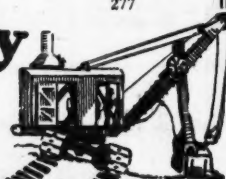
Railroad-type Marion on Crawler Trucks. Easily moved—fewer men required—no planking, ties or rails to handle.



The Marion Steam Shovel Company

Marion Ohio.

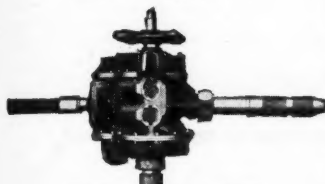
Marion Crawler Trucks Make Hard Going Easy



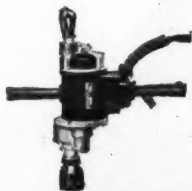
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Boyer Pneumatic Chipping and Calking Hammer — for machine and boiler shop service. A handy tool in connection with mine car repairs.



Little Giant Air Drill
—the pace setter in
reaming nut-and-bolt
tightening, etc.



Little Giant Portable Electric Drill — for rapid drilling, reaming, etc.

CP's contribution to lower machine shop costs

With a Little Giant Electric Drill and a Drilling Stand you can combine them into a high speed drill press in thirty seconds. They can be disassembled in the same period of time; the drill is then ready for use as a portable tool where required. It is economical to take the drill to the job and expensive to take the job to the drill.

Little Giant Air Drills literally punch holes through the hardest of steel. They will drill one and a half to two and a half inches per minute, depending upon the size of the drill being used.

Boyer Riveting Hammers drive rivets at a cost of three to five cents each. It costs from fifty cents to a dollar to cut out a loose rivet. The majority of Boyer driven rivets are perfectly driven. One or two less rivets to cut out daily pays for a Boyer in thirty to sixty days.

Think it over and let us assist you in lowering your machine shop and repair costs.

Chicago Pneumatic Tool Company

Chicago Pneumatic Building • 6 East 44th Street • New York

*Sales and *Service Branches all over the World*

*BIRMINGHAM	*CHICAGO	*DETROIT	FRANKLIN	*LOS ANGELES	*NEW YORK	RICHMOND	*SEATTLE	BARLE	BRUSSELS	COPENHAGEN	HELSINKI	*LONDON	*MONTEVIDEO	PARIS	SANTIAGO	SHANGHAI	TORONTO
*BOSTON	*CONCORDIA	EL PASO	HOUSTON	*MINNEAPOLIS	*PHILADELPHIA	SALT LAKE CITY	*ST. LOUIS	*BERLIN	BUEENOS AIRES	*FRANKFURT	HONOLULU	*MANTLA	*MONTREAL	RIO DE JANEIRO	SÃO PAULO	TIENTSIN	VANCOUVER
*BUFFALO	*CLEVELAND	FAIR	JOPLIN	*NEW ORLEANS	*PITTSBURGH	SAN FRANCISCO		BOMBAY	CHRISTIANIA	HAVANA	JOHANNESBURG	*MILAN	*OSAKA	*ROTTERDAM	SEOUL	TOKYO	WINGHONG

*BOSTON *CINCINNATI EL PASO HOUSTON *MINNEAPOLIS *PHILADELPHIA SALT LAKE CITY *ST. LOUIS *BERLIN BUENOS AIRES *FRANKFURT HONOLULU MANILA *MONTREAL RIO DE JANEIRO SAO PAULO TIENTEN VANCOUVER
*CHICAGO *DETROIT FRANKLIN LOS ANGELES NEW YORK *NEW ORLEANS *PITTSBURGH *SAN FRANCISCO *SEATTLE *TOKYO *WASHINGTON
*BIRMINGHAM *CLEVELAND *DALLAS *DENVER *INDIANAPOLIS *JACKSONVILLE *KANSAS CITY *LAS VEGAS *LOS ANGELES *MEMPHIS *MIAMI *NEWARK *NEW ORLEANS *NEW YORK *PHILADELPHIA *SAN FRANCISCO *SEATTLE *TOKYO *WASHINGTON

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BOYER PNEUMATIC HAMMERS · LITTLE GIANT PNEUMATIC AND ELECTRIC TOOLS
CHICAGO PNEUMATIC AIR COMPRESSORS · VACUUM PUMPS · PNEUMATIC HOISTS
GIANT OIL AND GAS ENGINES  ROCK DRILLS · COAL DRILLS

CHICAGO PNEUMATIC AIR COMPRESSORS · VACUUM PUMPS · PNEUMATIC HOISTS

GIANT OIL AND GAS ENGINES ROCK DRILLS · COAL DRILLS

CHICAGO

Depend upon



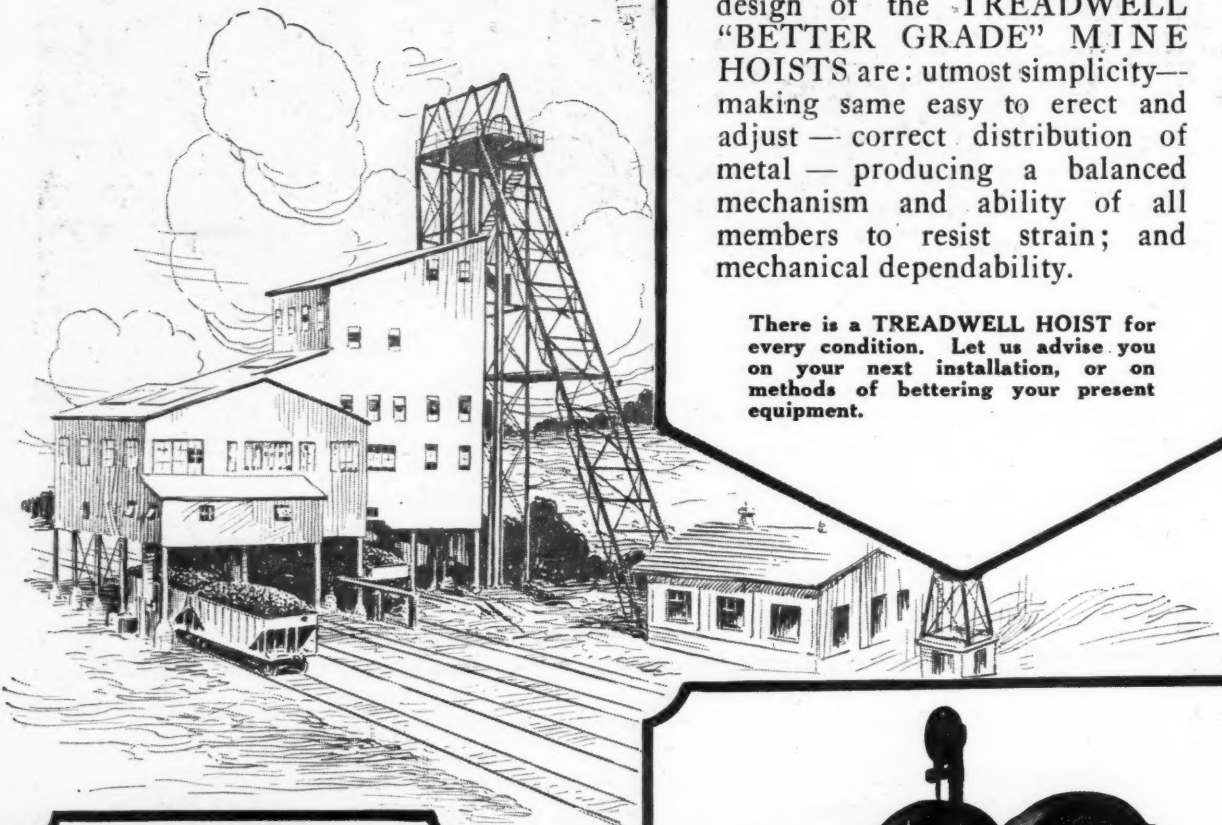
PNEUMATIC

that Name

Get Preferred Attention—Mention Coal Age in Writing Advertisers

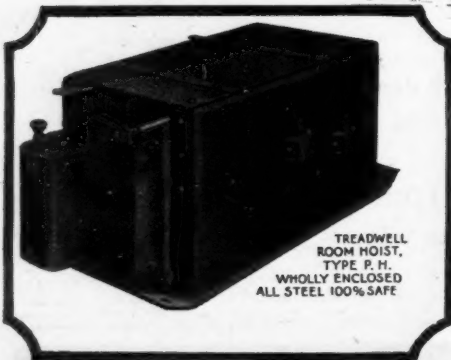
Treadwell

Steam and Electric Hoists

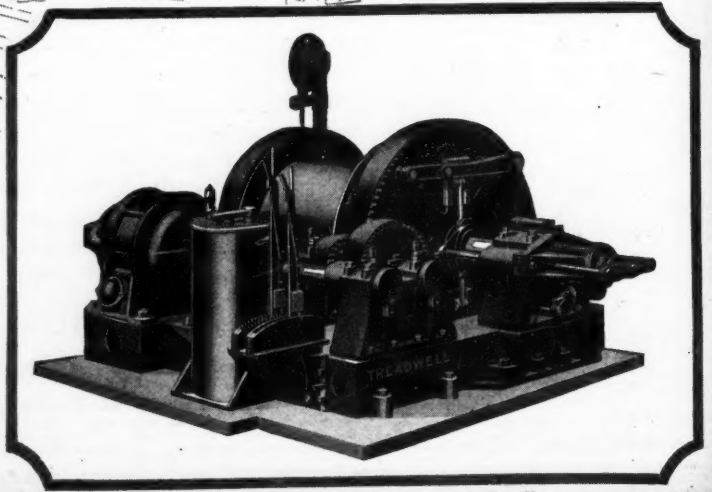


The basic features underlying the design of the TREADWELL "BETTER GRADE" MINE HOISTS are: utmost simplicity—making same easy to erect and adjust—correct distribution of metal—producing a balanced mechanism and ability of all members to resist strain; and mechanical dependability.

There is a TREADWELL HOIST for every condition. Let us advise you on your next installation, or on methods of bettering your present equipment.



TREADWELL
ROOM HOIST,
TYPE P. H.
WHOLLY ENCLOSED
ALL STEEL 100% SAFE



Treadwell Engineering Company

ROLLING MILL MACHINERY — PIPE MACHINES — ELECTRIC STEEL CASTINGS

Easton, Pennsylvania, U.S.A.

Get Preferred Attention—Mention Coal Age in Writing Advertisers



This up-to-date Mine in Kentucky is only one of many which have reduced production costs through the use of "AUTOMATIC" mine cars

When the engineers were told to construct a modern plant with modern equipment they naturally specified

S&D GRIFFITH AUTOMATIC DROP BOTTOM CARS

Do you suppose, after two years operation, that the mine owners are satisfied? Well, they are equipping their second mine with "AUTOMATICS" and putting the savings into their pockets.

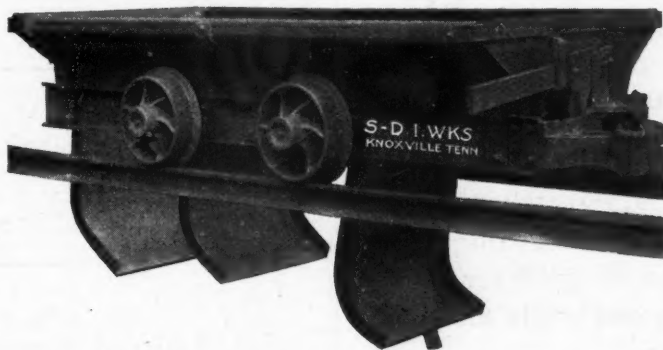
Actual figures are available to prove the decided economy in the use of automatic bottom dumping cars.

Literature and prices on request

SANFORD-DAY IRON WORKS

Knoxville, Tennessee

Makers of Cars and Whitney Wheels



Get Preferred Attention—Mention Coal Age in Writing Advertisers

Roller Bearing News

We sometimes see 'Paradise' coal advertised. Didn't know coal would be needed there.

5,064 of the 7,088 coal mines operating in 1921 were using animal haulage. All of them should have used Hyatt equipped mine cars, many of them did.

The offices of the New River Coal Operators' Association, formerly located at Charleston, W. Va., have been moved to Mount Hope, W. Va., and the office of the secretary and traffic manager consolidated, with S. C. Higgins, formerly traffic manager of the association, being made secretary and traffic manager, succeeding T. L. Lewis as secretary. *(Black Diamond.)*

"Ladees and gentl'm'n, begin to pack your duds for the biggest and grandest show of mining equipment and methods ever held, will surely be held, rain or shine, next September 24th to 29th in the beautiful city of Milwaukee. Good exhibits, good fellows, good golf, good dancing, good speeches, good auto rides, in fact, everything good will make the next meeting of the American Mining Congress the most gorgeous and wondrous display ever held under one roof."

"Friends, Romans and countrymen — my mine cars are equipped with Hyatt bearings, I have low haulage costs, have forgotten that there is such a thing as ever having to grease mine cars, my men are happier because the cars are easy to push and my production is getting better and better every day," is what a modern Mark Anthony of the coal industry would likely be moved to say.

Now that the weather is better and storms on the ocean milder, it is a great temptation to many fellows to start up a boat line to the Bahamas. Business must be good for everybody seems to be thirsty and while the goods go down the prices go up.

Our friend 'Rod' Neekamp has again been elected secretary of the Northeast Ky. Coal

Association. Those Kentucky colonels sure do wear fine sombreros and when you talk about running a bang, up-to-date coal association—they do it.

Those business statistics in Coal Age sure are hot stuff. They keep a fellow all pepped up and he knows what is what now, before he used to be in the dark.

There is one thing a mining man is never ashamed of and that is that his mine cars are equipped with Hyatt bearings. He swells up with pride when he tells how good they are.

Donk Bros. Coal & Coke Co. is erecting one of the largest tipples in the state of Illinois at Mine No. 4, near Edwardsville, Ill. The airshaft has been hoisting coal for two years and now the main shaft is about ready. The tipple will be wide enough for six tracks and will have a capacity of 6,000 to 8,000 tons of coal daily. It will be 85 ft. in height. The company also will install one 750-kw. and one 1,000-kw. turbine generator. Electric current will be supplied to the mine at Maryville as well as No. 4 mine. *(Coal Age.)*

And speaking of the Bahamas, back in the old days whenever you wanted two fingers of anything refreshing you called for it by name and weren't satisfied until you got it. Whenever you want mine cars equipped with Hyatt bearings, call them that, don't just say roller bearings. Get what you want.

The assigned car problem continues to prove very perplexing and this subject is worthy of earnest study by all who are affiliated with the coal mining industry.

The coal carrying capacity of the Pennsylvania Railroad System, has, in the last few months, been increased by what is equivalent to the addition of 2308 new coal cars to the service.

Roller Bearing News

Some weeks ago a friend of ours who sells Hyatt equipped mine car trucks went to a mine and saw an old fellow greasing plain bearing wheels. Most of the grease went on the ground. He asked the old man how much he got an hour and was told 80 cents for a ten hour day, making \$8.00. "But," the old man said, "I ain't worth it, mister, and I know it, and I would be willing to work for half as much if the cost of living would come down!" Which shows that occasionally we run across one of the mine workers who are of the old school and they, as a rule, fare worse than those who are more modern.

Every mining man who fails to send his operating, purchasing, and general supervisory heads to the Milwaukee meeting and exhibition of the best and latest equipment—September 24th to 29th—of the American Mining Congress will miss a grand opportunity to have his officials observe and hear the most recent developments in the mining world.

Not so long ago a mining man down in Eastern Kentucky told one of our fellows that the only trouble with Hyatt bearings is that they won't grease the wheels they are put in. We guess that Hyatts have done so much for him that he thinks they should cure all of his troubles just like a patent medicine. He shouldn't kick—he only has to grease them three times a year. Some snap!

Back 'befo' de war' the city of Milwaukee was famous for its sparkling brews. Now we seem to just recall that it's a beautiful city on the bank of a big lake with "water, water everywhere, and not a drop to drink."

Of course, we can't say for sure, but we are afraid that if some operators ever stopped to figure how much money they could have saved by using Hyatt equipped mine cars instead of the old-fashioned kind, the kind that run hard, that they would worry themselves to death. A word to the wise is sufficient.

The lake coal trade is running full tilt and the Northwest is getting lots of coal. General business is good up there in the summer resort country.

The Monogah Fuel Company having recently acquired a large tract of land adjacent to its present mine at Kuhn's Run, in the Marion County field of West Virginia, has completed plans for the installation of a plant with a daily capacity of 1,500 to 2,000 tons a day. The more the merrier.

Mine Operator: My Hyatt equipped cars are sure salubrious.

Another One: Say do you know what salubrious means. It means healthful.

First One: That's what I mean. They save so much money in the way of power, gouged out wheels, repairs to locomotives, and stuff like that, that they put joy into your life and if they do that they must be *healthful* cars.

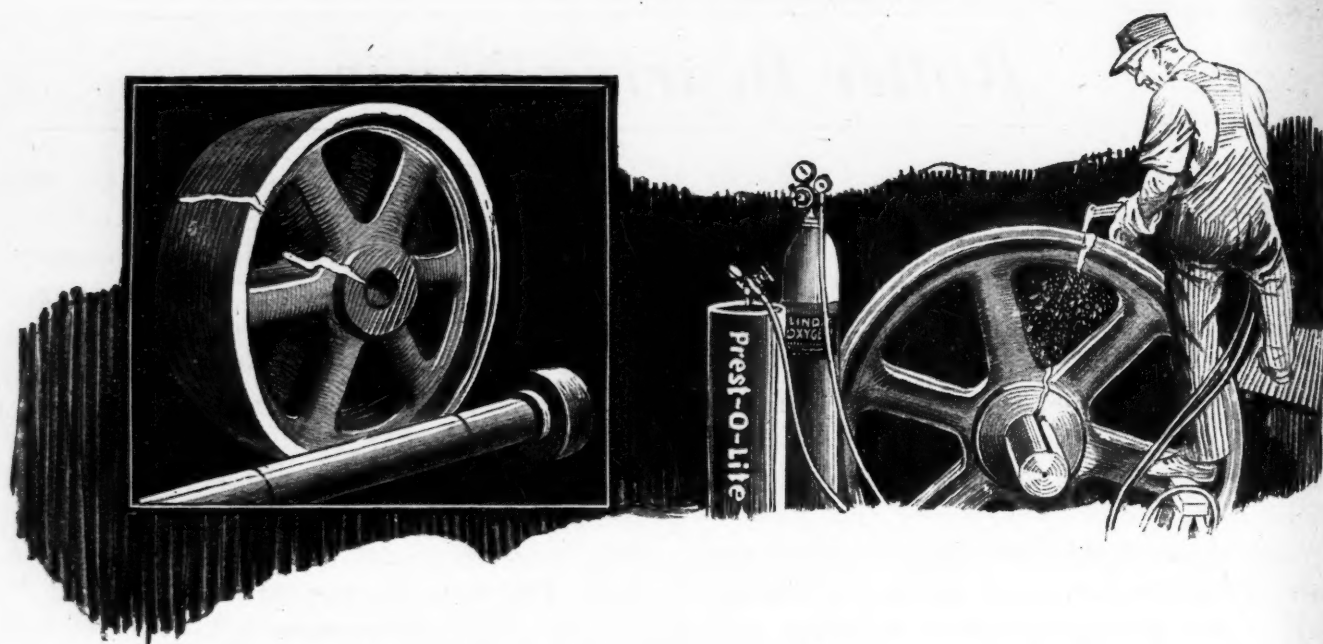
Shaker screen equipment of the most modern type was recently installed at the Eureka Mine of the Consumers' Fuel Company, Randall, W. Va.

It is reported that many mining districts are suffering because of the shortage of labor of the common class due to the immigration bars which are still with us.

Indiana people have organized the Erwin Block Coal Company which has a capital stock of \$150,000 for the purpose of operating in Southern West Virginia.

The Bell and Zoller Mining Company holds—at the time of going to press—the world's record for production of coal from one shaft in any single month. Hyatt equipped cars have been adopted as their standard.

You better ask almost any of the reputable mine car manufacturers to furnish you with Hyatt bearing trucks for your old or new cars.



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Here was a case that made the plant engineer scratch his head.

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The remedy—the standard Oxweld Cutting Torch. The operation was performed with neatness and dispatch and of course was absolutely successful, the shaft coming out in perfect condition.

Oxweld is continually coming to the aid of the industry with such feats as this. As the possibilities of the process become more widely appreciated it is considered more and more an indispensable part of plant equipment. Its saving in repair and reclamation is tremendous.

Oxweld Resident Engineers in over fifty cities are ready to advise in your problems on welding and cutting. Send for illustrated book, "Oxweld Can Do It."

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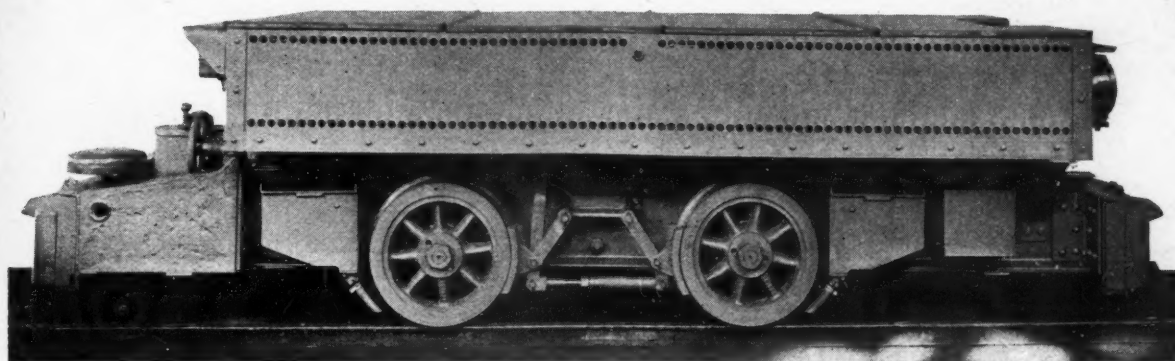
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¶ The above locomotive gathers and hauls to the parting a distance of 1300 ft., 125 cars in 8 hours. The cars weigh loaded $7\frac{1}{2}$ tons.

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¶ No cable to handle.

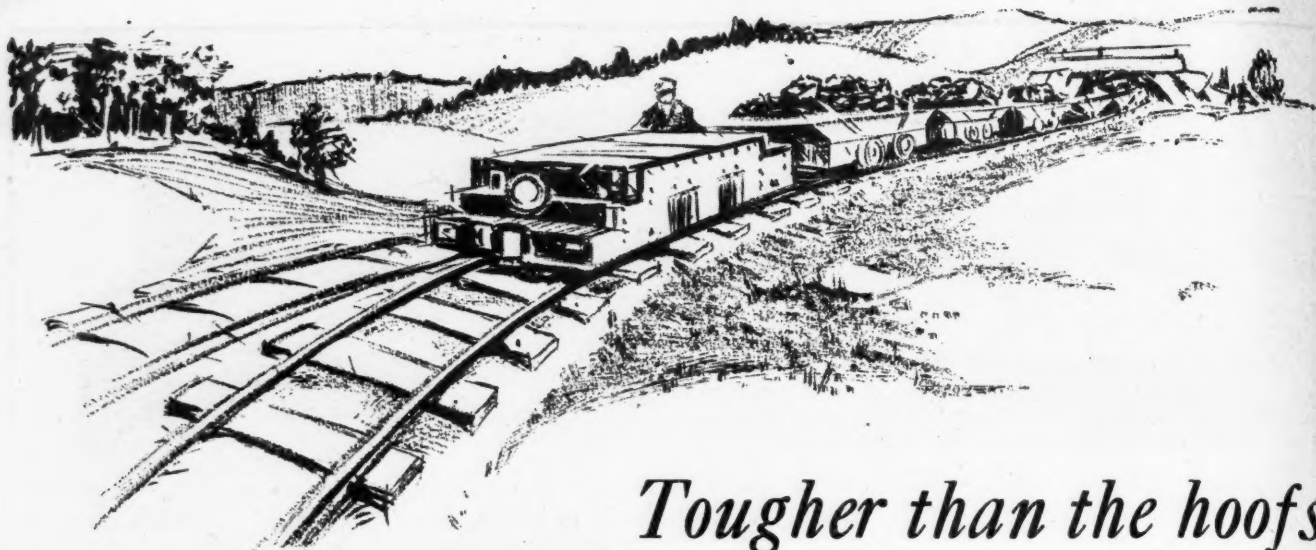
¶ Can you afford to continue with old methods?

¶ Investigate, we are at your service without obligation to you.

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Huntington, W. Va. Office: 816 Robson-Prichard Bldg.
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No rivets or bolts in its construction. No splice bars required. Guaranteed against breakage and will outlast a dozen or more cast-iron or semi-steel frogs.

A match for expensive manganese frogs used on standard-gage roads—and as low in cost as inferior steel track work.

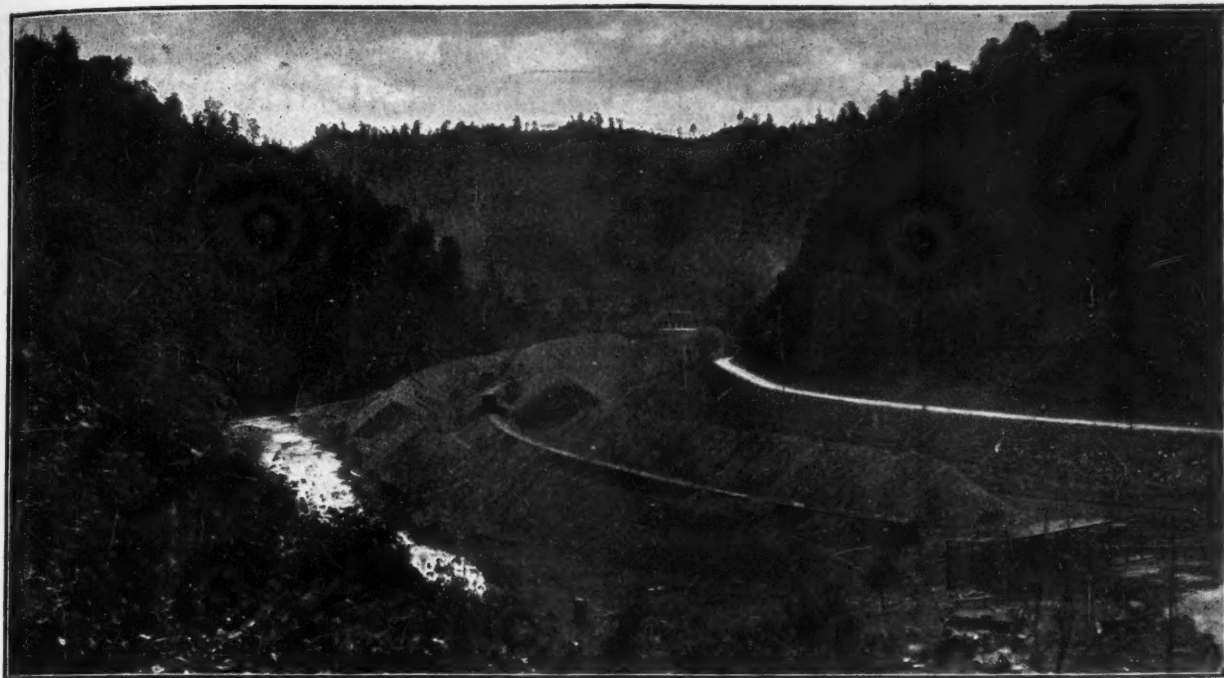
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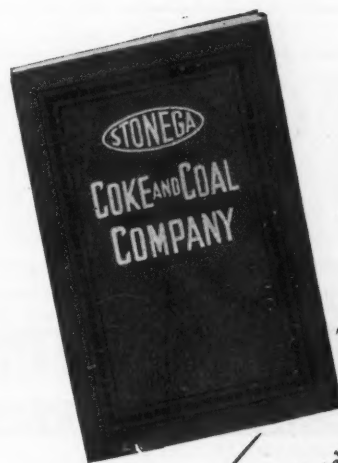
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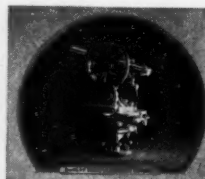
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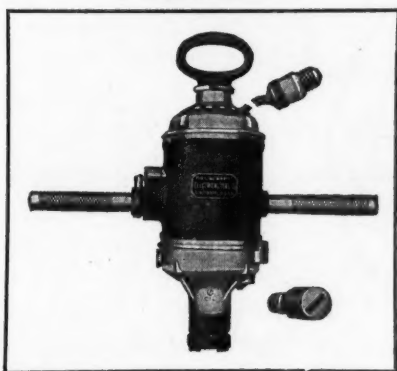
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RELAYING RAILS

600 tons 60's—200 tons 70's
1500 tons 75's—2000 tons 90's
EQUIPMENT BARGAINS

Bucyrus 14-B Steam Shovel, traction, ¾ yd., revolving.
Vulcan 36-in. ga., 14-ton, 4-wheel S.T. Locomotive.
American 36-in. ga., 18-ton, 4-wheel S.T. Locomotive.
Plymouth 24-in. ga., 3½-ton Gasolene Locomotive.
Koppel Cars, (3) 24-in. ga., 36 cu. ft. V shape.
Northern 20-ton Pillar Crane.
Lidgerwood 7x10-in. Hoister S.C., S.D. and boiler.

E. C. SHERWOOD
52 Church Street, New York.

RAILS

Complete stock, all section Relaying Rails. Get in touch with us by 'phone or wire for your requirements.

LOUIS COHEN & SON, Wilkes-Barre, Pa.

The Searchlight Advertising in This Paper

is read by men whose success depends upon thorough knowledge of means to an end—whether it be the securing of a good second-hand piece of apparatus at a moderate price or an expert employee.

The Best Proof

of this is the variety of this journal's Searchlight ads. Without a constant and appreciable demand for such machinery or services, by its readers, the market-place which these advertisements represent could not exist for any length of time.

Are you using the
Searchlight Section



FOR SALE

D. C. ENGINE DRIVEN SETS

ATTRACTIVE PRICE FOR QUICK SALE

- 1—Buckeye Engine, 18¾ x 18¾, direct connected to General Electric Co.'s generator, Type MP, Class 8-165-240, Form A-2, volts 250/275, generator No. 25826.
- 1—Buckeye Engine, 18¾ x 18, direct connected to General Electric Co.'s generator, Type MP, Class 8-165-240, Form L, volts 250/275, generator No. 31345.
- 1—Buckeye Engine, 18¾ x 18¾, direct connected to General Electric Co.'s generator, Type MP, Class 6-165-240, Form R, volts 250/275, generator No. 159425.
- 1—22 x 36 x 42 cross-compound vertical Corliss Engine, made by Filer-Stowell Co., Milwaukee, Wis., direct connected to General Electric Co.'s 525 kw., 525/575 volt, 100 r.p.m., generator No. 31209.
- 2—Allis-Chalmers 26 x 36 Corliss horizontal Engines, direct connected to Allis-Chalmers 500 kw., 550/575 volt, 125 r.p.m., generators Nos. 38316 and 38382.

The switchboard equipment for these generators will consist of generator panels only, which includes circuit breaker, ammeter and switches.

Filer-Stowell Engine and Generator available about July 1st, 1923. Allis-Chalmers Units available about August 10th, 1923. All of the above equipment is now in operation in the Pittsburgh district. Address T. S. Duncan, P. O. Box 940, Pittsburgh, Pa.

250 Volt

DIRECT CONNECTED UNITS

Kw.	Generator	Engine
500	Wghse.	Parsons Turbine.
400	Gen. Elec.	Ridgway side crank.
300	Cr. Wheeler.	Watts-Campbell-Corliss.
300	Ridgway.	Ridgway side crank.
250	Ridgway.	Ridgway side crank.
200	Wghse.	Skinner.
200	Gen. Elec.	Erie 4 Valve.
150	Ridgway.	
150	Gen. Elec.	Skinner.
120	Gen. Elec.	Harrisburg side crank.
100	Wghse.	Erie 4 Valve.
75	Wghse.	Harrisburg.
60	Gen. Elec.	Skinner Uniflow.
50	Gen. Elec.	Skinner.

Power Machinery Exchange
1401 Broadway Street, Jersey City, N.J.

DISMANTLING

MUST BE REMOVED!

Entire Plant, Buildings,
Machinery and Equipment

of

N. K. FAIRBANKS CO.

From 18th to 20th Sts.
on Wentworth Ave., Chicago, Ill.
(Gold Dust Twins)

POWER EQUIPMENT

200-kw., dir. conn., D.C. generating unit; 110-v. motors; hundreds of steam pumps, boiler tubes, pipe, steam engines, coal crusher, coal conveyors, fans, pulleys, hangers, shafting, belting.

TANKS

Over a thousand tanks of all sizes, square and round from 400-gal. to 250,000-gal. capacity. This lot includes scale tanks.

STRUCTURAL STEEL

Also fire escapes, building material and hundreds of other items too numerous to mention.

LUMBER

It Will Pay You to Visit and Inspect This Plant

American House Wrecking Co.

227 W. 19th Street, Chicago, Ill.

Phone, Victory 9237

Electric and Steam Hoists, Car Pullers, Room Hoists Gravity Spool Incline Drums

Give grade, length and load.

JOHN H. CARLIN MACHINE CO.

Sandusky-Lacock Sts., Pittsburgh, Pa.

The Latest and Best Types of Used Electric Motors and Generators

rebuilt Like New. All
kinds, all sizes, save 1/3
or more. Write today.
Established 1893. Largest
dealers in America.

**GREGORY
ELECTRIC CO.**
CHICAGO, ILLINOIS

MACHINES RENTED

16th and Lincoln St.

Used Rotary Converters

BARGAINS

- 2—slightly used 150 kw. Western Electric type H.C.C., 6—150-1,200 form P., 60 cy., 545 amp., 275 v., D.C., 1,200 r.p.m. each complete with 3 single phase transformers, 2,300 or 4,000 v., primary, also A.C. and D.C. panels with instruments for controlling. Practically new, only used two years. Also

Engine Generator Sets, Boilers and Motors

THE RANDLE MACHINERY CO.

1831 Powers St., Cincinnati, O.

Get Preferred Attention—Mention Coal Age in Writing Advertisers

"HONESTLY REBUILT"

ELECTRICAL MACHINERY

MOTOR DRIVEN PUMPS

- 8 in. Alberger 2-stage Centrifugal Pump, 75 hp., D.C. or A.C. motor.
6 in. Lawrence Cent. Motor to suit.
4 in. McGowan 2-stage Centrifugal Pump with motor.
2½ in. Advance 2-stage Centrifugal Pump with 10 hp. motor.
2 in. Deane Triplex Pump with Motor to suit.

MOTOR DRIVEN HOISTS

- Clyde Iron Works Friction Drum, 16 x 20 in., 5 in. Flange, 40 hp., 250 v. D.C. motor.
Clyde Iron Works Friction Drum, 16 x 20 in., 5 in. Flanges, 25 hp., 250 v. D.C. motor.
Lambert Friction Drum, 38 x 42, 5 in. Flanges, 40 hp., 250 v., D.C. motor.
Clyde Iron Works Friction Drum, 16 x 20 in., 5 in. Flanges, 30 hp., 3 ph., 60 cy., A.C. motor.
Stine Friction Drum, 8 x 10 in., 5 in. Flanges, 7½ hp., A.C. or D.C. motor.

Stock on Hand Bulletin No. 100 Just
Published Mailed on Application.

Miller Owen Electric Co., Inc.
PITTSBURGH, PENNA.

NEW BOILERS

- 7—300 hp., B & W. 200 lb.
4—150 hp., P. Return Tubular.

ROTARY CONVERTERS

Practically New

- 1—220 kw., G. E. 250/275 v.
1—330 kw., G. E. 250/275 v.
Both with 11000/6600 v., 3 ph.
Transformers. 2300 v. coils
can be furnished.

MOTORS

230-550 V.

We have an enormous stock of
standard makes at low prices.

Send for our 42-page catalogue,
covering every kind of a motor or
generator used.

We offer only our own material.

George Sachsenmaier Co.
932 N. 3rd St., Philadelphia, Pa.

Transmission

New and Used Dodge Equipment for
Immediate Delivery

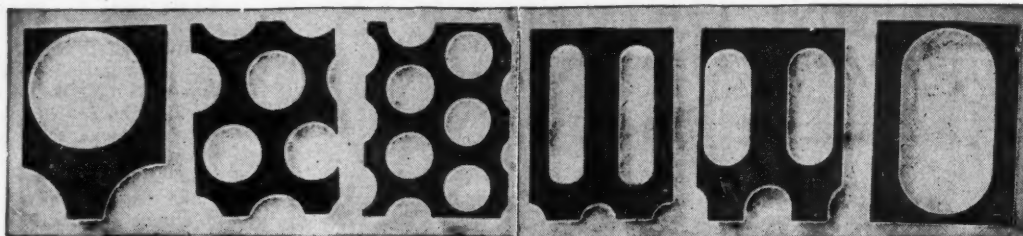
- Shafting—Cold Rolled Steel—All sizes and
lengths.
Shaft Hangers—All types and sizes.
Bearing—Capillary, Ring and Standard
Oiling.
Pillow Blocks.
Friction Clutches—Dodge Split, Solid and
Jaw.
Collars—Solid, Split and Thrust.
Pulleys—Split and Solid, Cast Iron, Steel
and Wood.
Bushings.
Grease Cups.

Our Bulletin No. 15 will give you
complete information.

Nashville Industrial Corporation
Jacksonville, Tennessee.

PERFORATED METAL

All sizes
and
shapes
of Holes



All kinds
and
thick-
nesses of
Metal

FOR SCREENING, SIZING and WASHING COAL

The Harrington & King Perforating Company

628 No. Union Avenue, Chicago, Ill., U. S. A.

New York Office: 114 Liberty Street



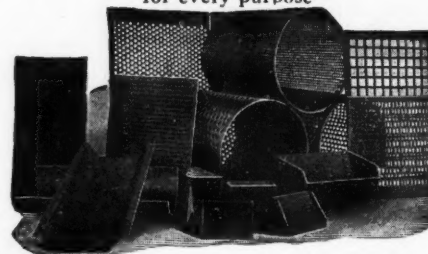
TIPPLE EQUIPMENT

Particularly for those conditions
which are unusual or exacting

THE C.O. BARTLETT & SNOW CO.
Main Office and Works: Cleveland, Ohio.

HENDRICK SCREENS

for every purpose



ELEVATOR BUCKETS (plain and perforated) STACKS AND TANKS
GENERAL SHEET AND LIGHT STRUCTURAL WORK
LIGHT AND HEAVY STEEL PLATE CONSTRUCTION

HENDRICK MFG. CO. CARBONDALE, PENNA.
New York Office, 30 Church St. Pittsburgh Office, 544 Union Trust Bldg.
Hazleton, Penna., Office, 705 Markle Bank Bldg.

Use PLAT-O TABLES

For Ore Concentration and
Coal Washing

DEISTER MACHINE CO.

Fort Wayne, Ind.

COAL OPERATORS

who are using Simplex Rivetless Chain operative on double
flanged sprockets specify no other, as this driving principle
has proven a saving of fully 20% over inside drive and
riveted types. THERE'S A REASON. Write for details.
Made 6 and 9-in. pitch.

CROSS ENGINEERING CO., Carbondale, Pa.

SCREENS OF ALL KINDS

Chicago Perforating Co.

2445 West 24th Place

Tel. Canal 1459

CHICAGO, ILL.



"PENNSYLVANIA"

Bradford Breakers and Coal Cleaners, Steel
frame Hammer Crushers, Armorframe Single
Roll Coal Crushers.

Send for Bulletin 6001

PENNSYLVANIA CRUSHER COMPANY
Stephen Girard Building, Philadelphia

BROWNHOIST

Locomotive Cranes
Grab Buckets
Belt Conveyors
Electric Hoists

Chain Conveyors
Feeders
Coal Crushers
Heavy Dock Machinery

THE BROWN HOISTING MACHINERY CO.
Cleveland, Ohio

**Coal
Washing
Machines**

for More Coal Sales
at Better Prices

Montgomery Coal Washing
& Mfg. Co.
BIRMINGHAM, ALA.



DEISTER-OVERSTROM
DIAGONAL DECK
COAL WASHING TABLES

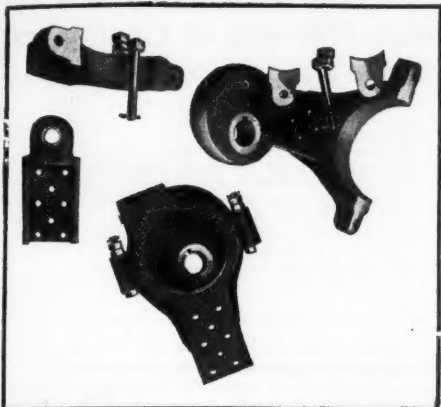
THE
DEISTER CONCENTRATOR COMPANY
FORT WAYNE, INDIANA

Electric Coal Mining Machines
Loaders for Coal, Ore, Salt, etc.
Locomotives for Gathering and Haulage
All Types—Suiting All Conditions
GOODMAN MANUFACTURING CO.
Chicago, Illinois

New York
Pittsburgh, Cincinnati, Charleston, W. Va., Birmingham, Denver, Seattle
St. Louis

Get Preferred Attention—Mention Coal Age in Writing Advertisers

EGYPTIAN IRON WORKS Shaker Screen Eccentrics



Special ball face design and unusual quality of workmanship and materials are insurances against shut-downs due to faulty eccentrics. The Egyptian eccentric adapts itself to minor inaccuracies of alignment which would break the ordinary eccentric. They are self-oiling, requiring a minimum of attention, and with full protection against damage.

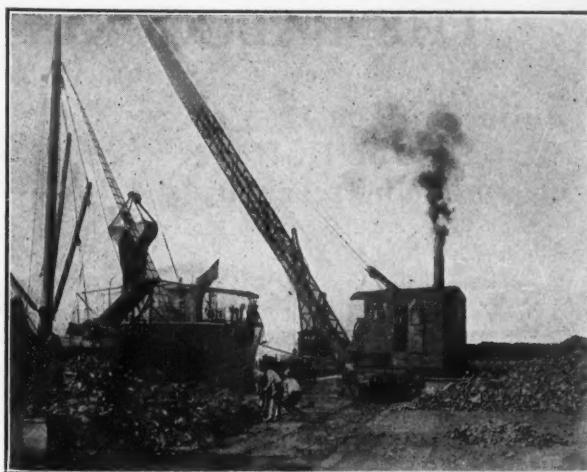
Send for blue prints, and a full description.

Send for Circulars on Egyptian Equipment

Egyptian Iron Works

"Dept. A"

Murphysboro, Ill.



The Big Value of "INDUSTRIAL" CRANES

Is They Do So Many Different Jobs—

With bucket—loading, unloading, reclaiming and storing of coal, sand, and gravel—switching cars—loading truck—making heavy lifts with hook and block.

*Our Golden Anniversary catalog
now ready for mailing*

INDUSTRIAL WORKS

Bay City, Michigan

1873

BUILDERS OF
CRANES FOR 50 YEARS

1923

ACCURATE WEIGHTS

—will save you money

Accuracy always pays. *Everybody* benefits by accuracy and real efficiency, and nobody loses anything.

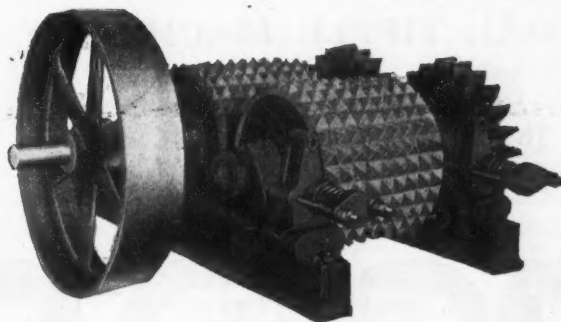
Streeter-Amet weighing and recording machines will weigh cars or hoppers at your tipple many times faster and far more accurately than weighing by hand. It both weighs and records—automatically. The uncertainty and mistakes of the "human element" are entirely eliminated. The miners depend upon the Streeter-Amet Machine because they know it is accurate. You save all losses due to overpayments.

Streeter-Amet Machines can be used with any standard scale. Sold, or rented.



**Streeter-Amet
Weighing &
Recording Co.,**

4101-4105
Ravenswood Ave.,
Chicago, Ill.



Scottdale Crushers Have Every Necessary Feature

Scottdale Coal Crushers, developed by years of service in coal fields and power plants, present each vital feature a crusher must have—sturdy, dependable construction, simplicity of design, and efficiency of performance.

Unusual quality of materials, heavy duty construction absolute simplicity, make continuous and dependable performance a certainty with Scottdale Crushers.

Marion quality is built into every one of them. There is a Scottdale Crusher for any requirement from 24 to 240 tons capacity. Send for bulletins.

**Marion Machine Foundry
& Supply Co.**

Box 950, Scottsdale, Pa.



MARION MINING
MACHINERY

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

**Builders since 1868 of
Water Tube Boilers
of continuing reliability**

BRANCH OFFICES

BOSTON, 49 Federal Street
PHILADELPHIA, North American Building
PITTSBURGH, Farmers Deposit Bank Building
CLEVELAND, Guardian Building
CHICAGO, Marquette Building
CINCINNATI, Traction Building
ATLANTA, Candler Building
TUCSON, ARIZ., 21 So. Stone Avenue
DALLAS, TEX., 2001 Magnolia Building
HONOLULU, H. T., Castle & Cooke Building
PORTLAND, ORE., 805 Gasco Building



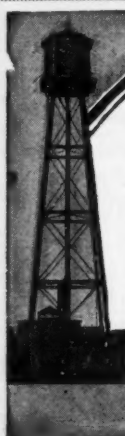
WORKS

Bayonne, N. J.
Barberton, Ohio

**Makers of Steam Superheaters
since 1898 and of Chain Grate
Stokers since 1893**

BRANCH OFFICES

DETROIT, Ford Building
NEW ORLEANS, 521-5 Baronne Street
HOUSTON, TEXAS, Southern Pacific Building
DENVER, 435 Seventeenth Street
SALT LAKE CITY, 705-6 Kearns Building
SAN FRANCISCO, Sheldon Building
LOS ANGELES, 404-6 Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Aguiar 104
SAN JUAN, PORTO RICO, Royal Bank Building



A Super Tower

Generosity typifies the design and construction of Caldwell Structural Towers. To provide the strength and sturdiness that have marked the unusual success of this type of tower for heavy loads and great heights we have spared no precaution in material or workmanship.

This tower is built of heavy structural shapes thoroughly laced and riveted together by the most modern scientific engineering methods. It is built for steel or wood tanks in capacities from 15,000 gallons upward.

Send for Catalog.

W. E. Caldwell Co.
Incorporated
2070 Brook St., Louisville, Ky.

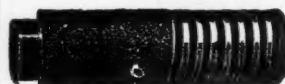
Caldwell

TANKS
AND
TOWERS

"TOLEDOS"—the efficiency tools for **"TOLEDO"** cutting and threading pipe, are recognized everywhere as the most desirable tools for this work. Insist on "Toledos" when ordering and you will never have a regret.

Our new Catalog G will be sent on request
THE TOLEDO PIPE THREADING MACHINE CO.
Toledo, Ohio.

Replace your Iron Pipe with WYCKOFF WOOD PIPE



Established 1855

Been in use over 68 years. Used extensively now by the vast majority of mines. Unaffected by acids, fumes, or electrolysis. Investigate.

A. Wyckoff & Son Co.
Elmira, N. Y.

COAL TIPPLE MACHINERY

"STANDARD" and "JUNIOR" Shaking Screens, Conveyors, Car Hauls, Steel Tipples, etc.

The Morrow Manufacturing Company
722 E. Tenth St., Wellston, Ohio



ROBERTSON PROCESS ASBESTOS PROTECTED METAL

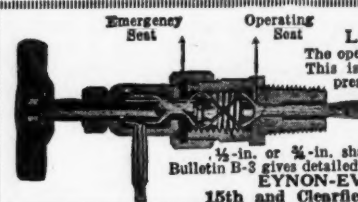
A Rust and Corrosion-Proof Building Material for Permanent Roofs, Siding and Trim
See front-cover advertisement in June 7th issue of Coal Age.

Write for Sample

H. H. ROBERTSON CO., Pittsburgh, Pa.

ROOT

Spiral Riveted Pipe—
Pipe Specialists for 43 years
Abendroth & Root Mfg. Co.
Works: Newburgh, N. Y.
N. Y. Office: 233 Broadway



**Ace High Among
Locomotive Gauge Cocks**

The operating seat is renewed not reground. This is accomplished with cock under full pressure and at a few cents cost. Railroad and industrial locomotives have been equipped for years, and users never go back to simple types. Your order for 1/4-in. or 3/8-in. shank cocks will be filled from stock. Bulletin B-3 gives detailed information.

EYNON-EVANS CORPORATION
15th and Clearfield Streets, Philadelphia, Pa.

Robins Conveying Systems
for every coal handling requirement
Belt Conveyors, Elevators, Crushers, Screens, Etc.

Write for Hand Book of Conveyor Practice

ROBINS CONVEYING BELT COMPANY

New York Chicago Pittsburgh Boston

Acid-Proof Wood Pipe for mine water



**The Michigan
Pipe Co.**
Bay City
Michigan

WE-FU-GO AND SCAIFE

WATER

PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES

WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

UNIVERSAL CAST IRON PIPE

Can be taken up and relaid repeatedly without injury to joints—experienced labor unnecessary. Write or wire nearest office.

THE CENTRAL FOUNDRY COMPANY

New York Chicago Birmingham Dallas San Francisco

Get Preferred Attention—Mention Coal Age in Writing Advertisers



Little Giant Power Hammers

Motor or Belt Driven
25, 50, 100, 250, 500 and
1000 lb. Models

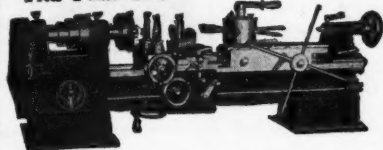
Are used by more than 1100 American mines.

Will pay for themselves every month of steady work for twenty years or more.

Have very small upkeep—our annual repair sales average 48c. each on all sizes and ages in use.



Pick Point Dies.



Little Giant Combination Metal and Wood Lathe. Every mining repair shop should have one.

All Little Giant Products are sold on 30 days' trial and guaranteed FOREVER against defective material and workmanship.

Little Giant Company

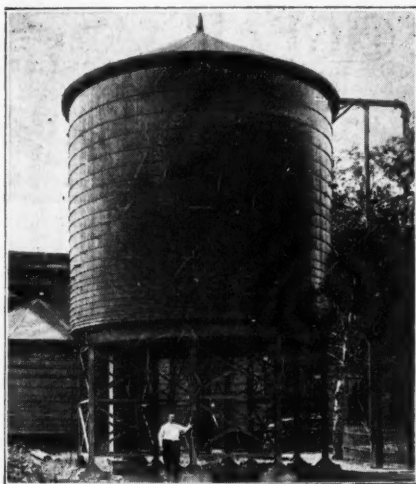
102 Rock Street
Mankato, Minn., U. S. A.
Established 1876



Puncher Pick Dies.



Chisel Bit—Pick Point Dies.



It's a HAUSER-STANDER!

—for long economical service

Wood tanks that give years of service is the only kind Hauser-Stander builds. They're the tanks that last the longest and cost the least to maintain. They're the most economical form of water storage, from any angle.

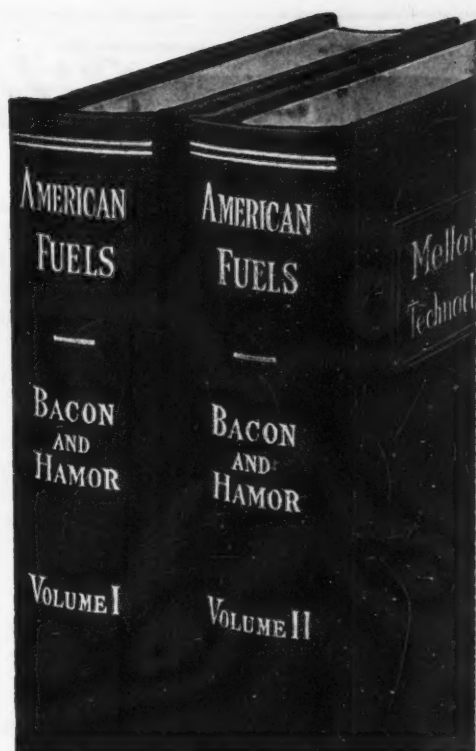
Fifty years' experience has taught Hauser-Stander how to build wood tanks. We have a book on tanks every mine operator should have.

Send for your copy.

The Hauser-Stander Tank Co.
Cincinnati, Ohio

Pittsburgh Office: 506 Bakewell Bldg.

Every
coal
company
should
have
a set
of this
work



Bacon and Hamor's

American Fuels

By RAYMOND FOSS BACON, formerly Director of the Mellon Institute of Industrial Research, and WILLIAM ALLEN HAMOR, Assistant Director of the Mellon Institute of Industrial Research.

Assisted by a Staff of 20 Specialists

MELLON INSTITUTE TECHNOCHEMICAL SERIES

Volume I.—630 pages, 6 x 9, 132 illustrations.

Volume II.—615 pages, 6 x 9, 250 illustrations.

Per Set, \$12.00 net, postpaid. Not sold separately.

THE whole subject of the characteristics and economic utilization of fuels of all kinds is exhaustively treated in this comprehensive treatise.

The engineer will find it a complete summary of modern information concerning fuels. Every important research effort, every worthwhile investigation, in the field of fuel engineering, is here summarized and interpreted in the light of modern practice.

Every coal company should have this great work available for reference. It will supply sales ammunition, engineering data, cost data and information on testing and analysis that will prove of priceless value.

The two books present for the fuel producer a complete encyclopedia on every phase of fuel production and use.

The books cover

the characteristics of fuels
the production of fuels
by-products
analysis and testing
economic utilization of fuels

advantages of specific fuels for
specific purposes
relative costs of fuels
fuel conservation

Examine this work for 10 days FREE

Free Examination Coupon

McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York.

You may send me on 10 days' approval: Bacon and Hamor's American Fuels, \$12.00 net, postpaid. I agree to remit for the books or return them postpaid within 10 days of receipt.

.....I am a regular subscriber to Coal Age.

Signed

Address

Official Position

Name of Company

(Books sent on approval to retail purchasers in the U. S. and Canada only.) C 6-28-23

Get Preferred Attention—Mention Coal Age in Writing Advertisers

Flood City

Manufacturers of

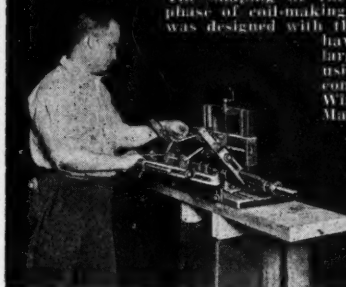
Mine Hoists	Bronze Bushings and Castings
Room Hoists	Armatures and Field Coils
Trolley Line Material	Field Coil Test Machines
Rail Bonds	Bearings for
Arc Welding Machines	Locomotives and Mining
Trolley Harps and Wheels	Machines

Flood City Mfg. Co.

Johnstown, Penna.

SEGUR Coil Spreader

The shaping of the coil is the most important phase of coil-making and the Segur Coil Spreader was designed with this fact clearly in mind. We have reports from all kinds of large users of motors who are using the Segur Coil Spreader in conjunction with the Segur Coil Winding Machine and are effecting large savings in matters of motor maintenance. Send for Segur data sheets.



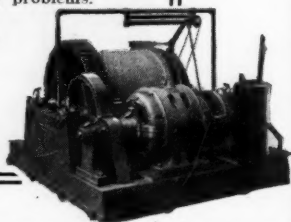
**Electric Service
Supplies Co.**
Manufacturers, Jobbers,
Exporters
Philadelphia, New York,
Chicago, Boston, Pitts-
burgh, Scranton

OTTUMWA Electric and Steam HOISTS

Ottumwa Hoists comprise a line which completely covers the requirements of coal mines. Ottumwa Engineers are always available for consultation regarding hoisting problems.

Ottumwa Iron Works
Ottumwa, Iowa

Ottumwa Electric and Steam
Hoists, Mine Cars, Sheave
Wheels and Rollers and
Roller Bearing Trucks.



Turbine Centrifugal and Disc Fans

Robinson Ventilating Co.
6027 Jenkins Arcade
Pittsburgh, Pa.
Factory at Harmony, Pa.



MOTOROPE HOIST

Electric
or
Gasoline

Palmros Machinery Sales Corp.
Agents wanted
SYRACUSE, N. Y.

"Sirocco" Fans and "Ventura" Fans for
Mine Ventilation
Complete Engineering Service

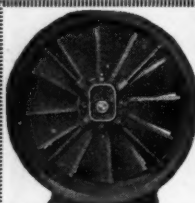
American Blower
AMERICAN BLOWER COMPANY, DETROIT (255)

TURBOGEAR

is an internal herringbone planetary gear speed transformer, the most efficient by test. Used with engines, motors, turbines, to drive compressors, fans, pumps, etc. Write for our recommendations.

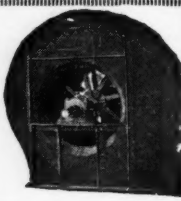


Poole Engineering & Machine Co. Baltimore, Md.



**BUCKEYE
BLOWER
COMPANY**

BUCKEYE MINE FANS—ALL SIZES
Columbus, Ohio.



FALK

HERRINGBONE GEARS
Precision-made speed reduction units
—any size—for any job.
THE FALK CORPORATION
Milwaukee, Wisconsin

Chattanooga ARMATURE WORKS.

REWINDING ELECTRICAL
PAIRING BUILDING MACHINERY

CHATTANOOGA, TENN

NORDBERG



MACHINERY

NORDBERG

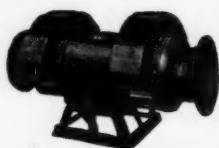
Uniflow Engines · Corliss Engines · Diesel Engines
Steam and Electric Hoists
Condensers · Compressors · Special Machinery

NORDBERG MANUFACTURING CO.
MILWAUKEE WISCONSIN

STERLING Electric Siren

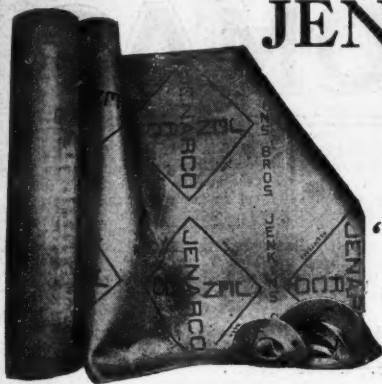
used extensively at coal
mines to give work signals
and as an alarm in case of
fire, accident, riot, etc.

Interstate Machine Prod. Co., Inc.
45 Allen St., Rochester, N. Y.



JAMES
SPEED REDUCING TRANSMISSION
The Universal Drive

Made by
**D. O. James
Mfg. Co.**
1118 W. Monroe St.
Chicago, Ill.



JENARCO

*In sheets
or
"ready-cut"
gaskets*

Strong, tough, durable

These are the qualities of Jenarco Sheet Packing that mean tight, leak-proof joints on lines carrying saturated steam, hot or cold water, and other fluids.

In *Jenarco* are combined knowledge and skill acquired by long experience and determination to produce only the best.

Know *Jenarco* by its name and dark red color. Obtain it through your supply man.

Use Jenkins Compressed Asbestos Jointing for superheated steam service.

JENKINS BROS.

New York

Boston

Philadelphia

Chicago

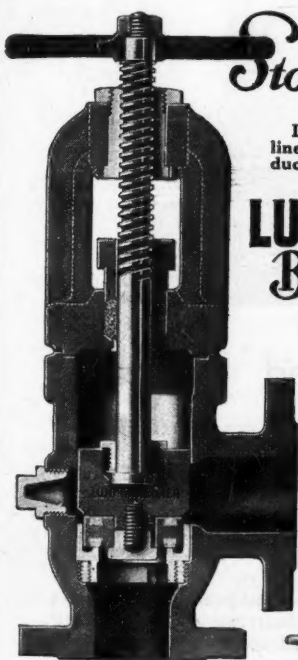


Fig. 897

Stop that waste!

Leakage through the blow-off line causes heat waste and reduces the efficiency of the boiler.

LUNKENHEIMER Blow-off Valves

remain tight under the most extreme operating conditions because their design guards against the CAUSES of a leakage by automatically cleansing the seating surfaces before the disc becomes seated and by minimizing wire drawing of the water across the seating surfaces.

Their construction permits of only a very gradual release of the water, and the danger incident to undue agitation of the water within the boiler and severe shock in the discharge line caused by sudden release, are eliminated.



Fig. 835

Booklet 515J describes the complete line. Write for a copy.

THE LUNKENHEIMER CO.

QUALITY
LARGEST MANUFACTURERS OF
HIGH GRADE ENGINEERING SPECIALTIES
IN THE WORLD BOSTON
CHICAGO CINCINNATI U.S.A. LONDON
EXPORT DEPT. 189-125 LAFAYETTE ST. NEW YORK

"America's Best since 1862"

Blow-off and Gate Valve Combination providing double assurance against leakage, greater safety, and enables blow-off valve repairs while boiler is under pressure.

16-26-9



There is no excuse in these days for using short-lived or weak materials in gearing. Chemistry and Metallurgy enable the gear manufacturer to determine the best materials, and we employ every art, science and craft to produce only the best gearing.



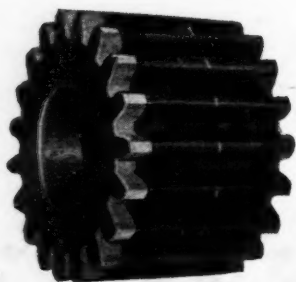
R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

Philadelphia Office: 420 Land Title Bldg.
Chicago Office: 2133 Conway Bldg.

A Cure for Pinion Chipping

In the early days of hardened gears and pinions, chipping was not uncommon. With our "Tool Steel" product about two years ago, we absolutely solved this by softening the ends of the teeth a little at the armature end, so they would not chip.

This is illustrated by the accompanying cut.



White indicates the soft end of teeth
to eliminate chipping

*The standard of Quality
"Tool Steel" gears + pinions.*

The Tool Steel Gear &
Pinion Co.
Cincinnati, Ohio

THOMAS

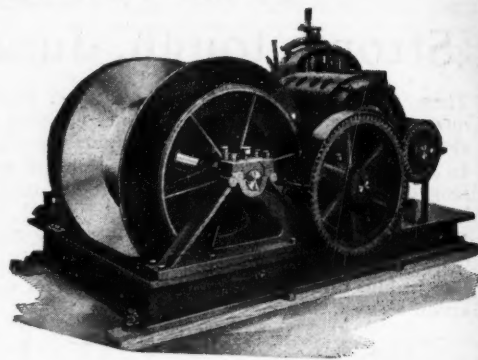
The results of more than thirty years' experience in solving coal mine hoisting problems is concentrated into the design and construction of Thomas Hoists. Each type of Thomas Hoist has been designed to meet a particular mine hoisting need. For either counterbalanced shaft hoisting or incline hoisting, there is a type

and size of Thomas Hoist that will exactly meet your requirements, giving service of the highest efficiency, with lowest of upkeep costs.

The Thomas Elevator Company's Engineering Department is at your disposal. They will give you accurate counsel regarding any hoisting problem.

Thomas Elevator Company

29 So. Hoyne Ave., Chicago, Ill.



HOISTS



No Exposed Threads

Threads on SURE GRIP Trolley Clamps are absolutely protected from rust, dampness and battering. This makes the SURE GRIP Clamp good for years of service. It can be removed again and again from old working parts of the mine and used in a new location. It never wears out.

SURE GRIP Clamp will stop all your troubles with faulty over-head construction. SURE GRIP Clamps *holds*—under all conditions.

Electric Railway Equipment Co.
2900 to 2918 Cormany Ave.
Cincinnati, Ohio

SURE GRIP



MATCHLESS TROLLEY

"Easiest to Start—Easiest to Keep Going"



Pulling a 1-ton Load with a 14-lb. Weight

The above test is graphic proof of the little effort required to start a heavy load and convey it to any desired point, when carried on a Matchless Timken-Roller-Bearing Trolley.

At 14 lbs. the trolley with its 1-ton load, started smoothly and rolled rapidly along the length of the overhead rail.

The Matchless required only about half the pull demanded by any other trolley—ball or roller bearing—when given the same identical test.

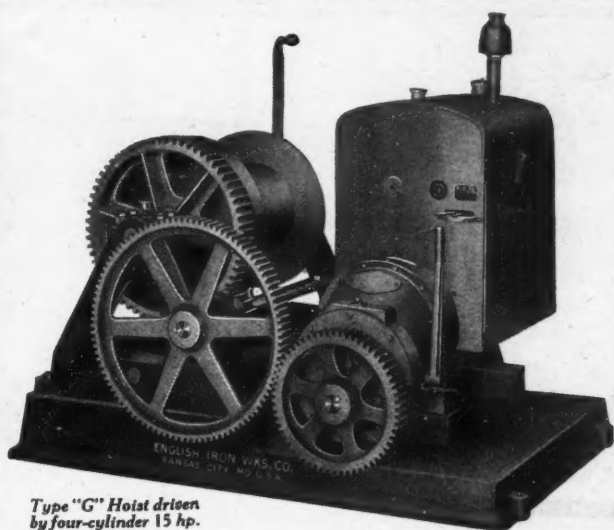
Matchless Trolleys in your plant mean less energy used, speedier action and more output per man.

Chisholm - Moore Matchless "Trolleys," "Cyclone" Chain Hoists, and "Carryall" Overhead Track Systems carried in stock by capable distributors in all localities.

Complete catalog, price and name of nearest representative on request.

The Chisholm-Moore Mfg. Co.
Cleveland, O.

Hoists Cranes Trolleys
Overhead Track Systems
Branches: New York, Chicago, Pittsburgh



Type "G" Hoist driven by four-cylinder 15 hp. Gasoline Engine.



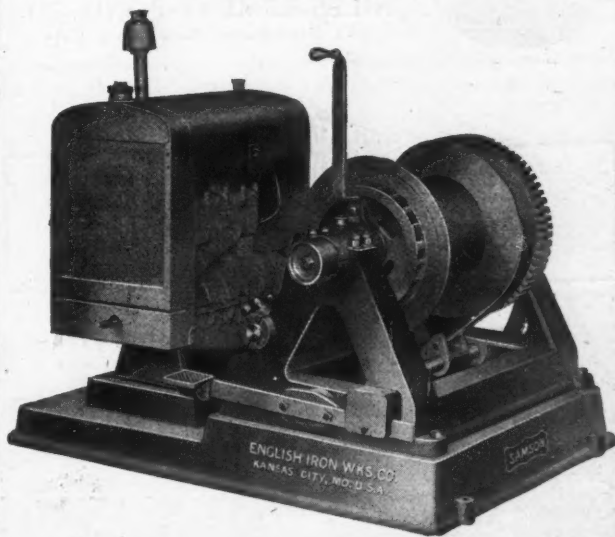
OUR type "G" affords a wide range of utility and it is economical. With its four-cylinder engine it is mounted on a cast iron sub-base as a completely self-contained unit. The drum is 12 inches in diameter by 16 inches long, fitted with bronze bushings and controlled by cone friction clutch and band brake. The lifting capacity is 2,000 lbs., plus a substantial reserve.

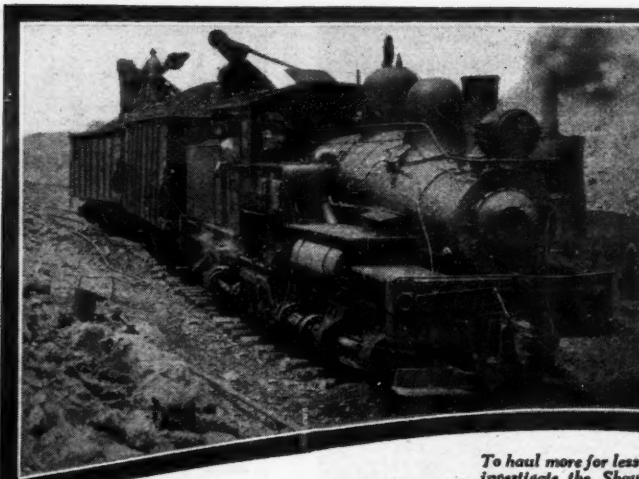
Guards (not illustrated) are furnished for gears and pinions.

The four-cylinder Gasoline Engine which supplies the power for this Hoist, contains all the good points of the most successful automobile engine. It is fitted with clutch to release engine for easy starting. A positive fly-ball throttle type of governor is used all enclosed and running in a bath of oil. Also high tension magneto and float type carburetor. It requires 15 to 20 per cent less fuel and oil than single cylinder engines and it runs without vibration.

Write for full details of the Type "G" and other Samson Hoists

English Tool & Supply Co.
Iron Works Department.
Kansas City, Mo., U. S. A.





To haul more for less—
investigate the Shay

Said One Coal Operator—

"Our 50-ton Shay Geared Locomotive has been working here four years. During that time, it has never been out of service for repairs. All the working parts are easily reached, and necessary minor adjustments, therefore, are quickly made. Some of the grades it runs over are very

heavy. The Shay is giving us fine service."

Consider the effect of such continuous operation on the production of your mine!

Write us now. We will be glad to explain in detail the many advantages of Shay Geared Locomotives.

LIMA LOCOMOTIVE WORKS, Incorporated

17 East 42nd Street, New York

Lima, Ohio

HERRINGBONE CUT GEARS
MILL DRIVES
SPEED REDUCERS
FAWCUS
SPUR WORM BEVEL GEARS
FAWCUS MACHINE CO. PITTSBURGH, PA.

PLYMOUTH
Gasoline Locomotives
For Mine and Industrial Haulage
Ask for Bulletins
THE FATE-ROOT-HEATH CO.
Plymouth, Ohio, U. S. A.

MAA GEAR
Strongest at the base
Where strength is most needed
NILES-BEMENT-POND CO.
111 Broadway, New York City

MEDART means EVERYTHING
Line Shafting Equipment
THE MEDART COMPANY
(Formerly Medart Patent Pulley Co.)
General Offices and Works: St. Louis, U. S. A.
Office and Warehouse: Cincinnati
Offices: Chicago and Philadelphia

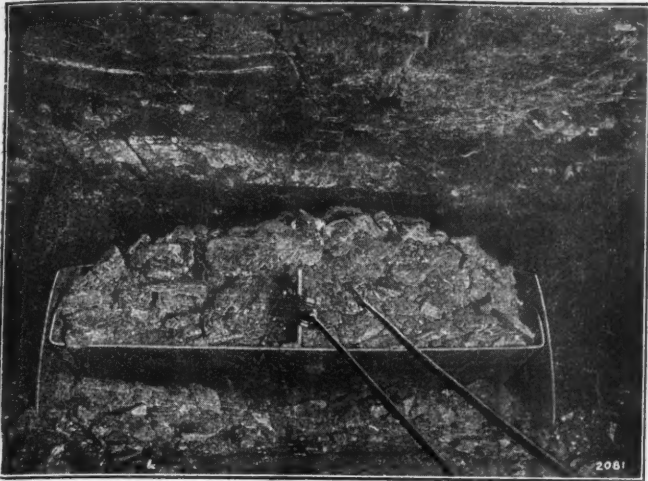
WHITCOMB
Manufacturers of Locomotives
Gasoline-Storage Battery-Trolley-Combination
Geo. D. Whitcomb Company
Rochelle, Illinois, U. S. A.
See our ad. in the first issue of each month

ATLAS
Mine Locomotives
THE ATLAS CAR & MFG. COMPANY
Engineers CLEVELAND, O. Manufacturers
Illustration of various mine locomotives and cars.

Mancha's Electric Mule
Mancha Storage Battery Locomotive Co.
St. Louis, Mo.
Representatives In All Principal Cities

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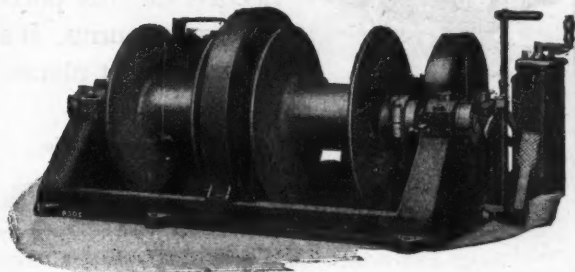
LIDGERWOOD MINE HOISTS



Steam—Electric For every mine service

Illustrations show the "Strange" Self-Loading Scraper Bucket, which is in successful use; and the specially designed Lidgerwood electric hoist used in connection with same. The bucket handles a ton each trip, stays on the ground, is self-loading at the face, and self-unloading at entry. The complete outfit is for sale by the

Co-operative Utilities Co., Inc.
1014-5 Harrison Bldg.
Philadelphia, Pa.



*The Proof of Lidgerwood Quality
is in the work of their products*

LIDGERWOOD MFG. CO.
96 Liberty St., New York

Chicago
Cleveland
Detroit
Pittsburgh
Birmingham, Ala.

Philadelphia
Seattle
Los Angeles
San Francisco
Portland, Ore.

Charleston, W. Va.
London, Eng.
Sao Paulo, Brazil
Rio de Janeiro, Brazil
Apartado 812, Mexico

The Locomotive with a Reputation

WHEN you buy a "MILWAUKEE" you buy more than a mere machine—you buy a locomotive that enjoys a world wide reputation for absolute dependability in service and economy in operation.

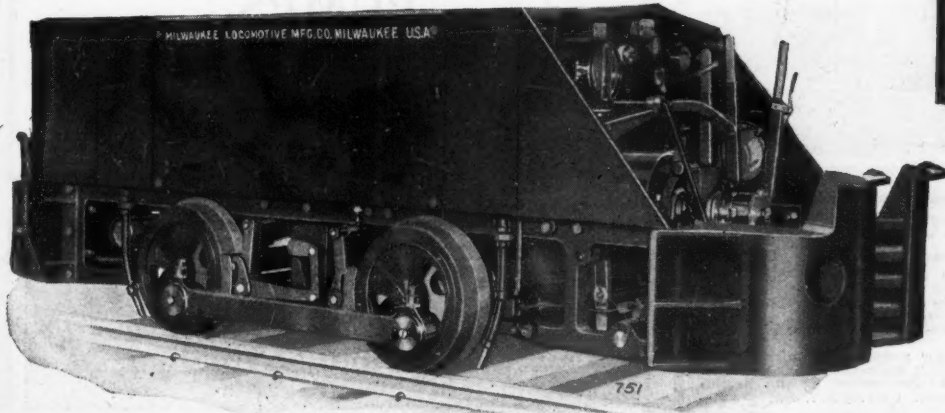
It Speeds Up Production and Cuts Haulage Costs

A sturdy, powerful haulage unit, designed especially for mine haulage, that will move your output from the mine, faster and at less cost.

Learn more about the "Milwaukee"—Write for Catalog A-123


MILWAUKEE LOCOMOTIVE MFG. COMPANY
MILWAUKEE, WIS., U. S. A.

**MILWAUKEE
GASOLINE
LOCOMOTIVES**



You'll never know how much real value can be built into a locomotive until you learn more about the "Milwaukee"

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Who put
the **EASE**
in **GREASE**
?
HULBURT

Find out today about our 90-day trial plan

HULBURT OIL & GREASE CO.
Erie Avenue and Trenton Street, Philadelphia, Pa.



Longer Service—Less Lubrication

THE SENSENICH TRUCK

insures light running and saves power. Made with enclosed hub wheels in which a U-form bent steel pipe is cast to secure lubrication in all positions. There is no chance for oil passageways to become clogged. The wheel is held in place on the axle by a malleable iron lug that fits in a groove. The axle itself is also free to revolve in stationary boxes. Hyatt Roller Bearings can be furnished on request. Write for details.

Irwin Foundry & Mine Car Co., Irwin, Pa.




FIG. 70
For General Service

Little Head-Room
needed for this port-
able mine pump. It's
built for tight places.

Complete Mine Pump Bulletin on Request
THE DEMING CO. Est. 1880 Salem, Ohio
"Distributors in All Principal Cities"

Deming

HAND AND POWER **PUMPS** FOR ALL USES



Feeds without fric-
tional heat and main-
tains its normal con-
sistency in all tem-
peratures, from 40 de-
grees below zero to
300 degrees above.
And no pressure is
great enough to cause
it to drip from bear-
ing surfaces.

KEYSTONE GREASE
The Master Lubricant
TRADE MARK REG. U.S. PAT. OFF.

Write for Bulletin Number 26

The Keystone Lubricating Company
Established 1884
Executive Offices and Works, Philadelphia, Pa.
Branches throughout the World



PORTER LOCOMOTIVES
FOR STRIPPING AND
YARD HAULAGE
H. K. PORTER CO.
PITTSBURGH, PA.

ALLIS-CHALMERS
MILWAUKEE, WIS. U.S.A.

Power and Electrical Machinery, Mining Machinery, Pump-
ing Engines, Centrifugal Pumps, Crushing Machinery, Steam
and Electric Hoists, Power Transmission Machinery, Timber
Treating and Preserving Machinery, Air Compressors.

Before we buy power
Let us get the new book on
THE UNA-FLOW STEAM ENGINE
By PROF. J. STUMPF
Price \$4.00 Write Now. Postage paid.
Stumpf Una-Flow Engine Company, Inc.
206 E. Genesee St. Syracuse, N. Y.



MODERN MINE PUMPS
HAZLETON
BARRETT, HAENTJENS & CO. HAZLETON, PA.

AMERICAN
Gasoline Locomotive

This little 4-ton machine is the
pride of the men on the job—
to have pride in anything one
has to have faith in it and faith
grows out of knowledge of per-
formance. This little Gas-O-
Motive performs.

The Hadfield-Penfield Steel Co.
Bucyrus, O.



PUMPS
Electric, Steam, Boiler Feed
BOYTS, PORTER & CO.
Connellsville, Pa.

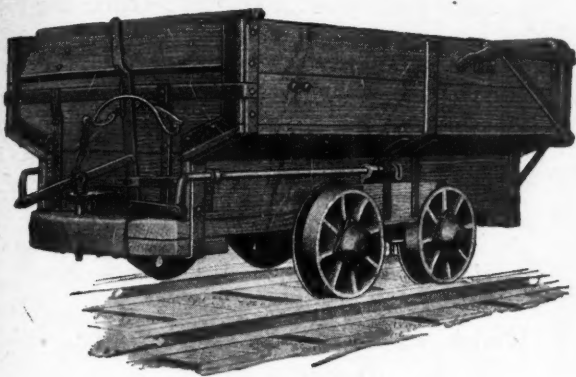
DE LAVAL STEAM TURBINE CO.
Trenton, N. J.



Steam Turbines, single and multi-stage, geared and
directly connected, and for belt and rope drives; for all
steam conditions; capacities up to 15,000 hp. Catalog D71.
Complete Turbo Generator Sets.
Double Helical Speed Reducing Gears for high speed
service. Catalog G71.
Centrifugal Pumps, single and multi-stage, horizontal
and vertical shaft, for all heads and capacities. Catalog B71.
Centrifugal Blowers and Compressors for all deliveries
and all pressures up to 125 lbs. Catalog L71.

RIDGWAY
POWER UNITS
To produce unfailing power economically
Ridgway Dynamo & Engine Co.
Ridgway, Penna.

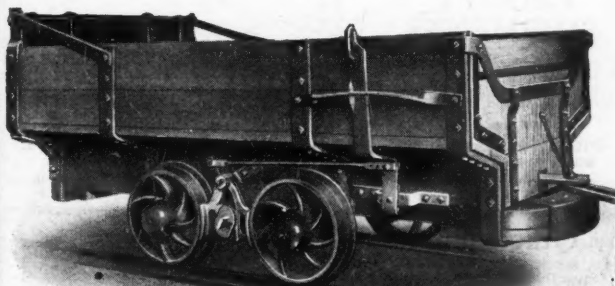
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We built good mine cars 60 years ago—they pleased us—they pleased coal customers and today—
we offer you—
the same good cars—
plus our long manufacturing record.

The
**WATT
MINING CAR
WHEEL CO.**

Barnesville,
Ohio



*If it's a Helmick—
that's all you need know!*

Depend upon it—there's no such thing as a sturdier, easier going, more trouble-free Mine Car than the Helmick.

For 35 years it has been made to suit the toughest conditions—and it's made good everywhere.

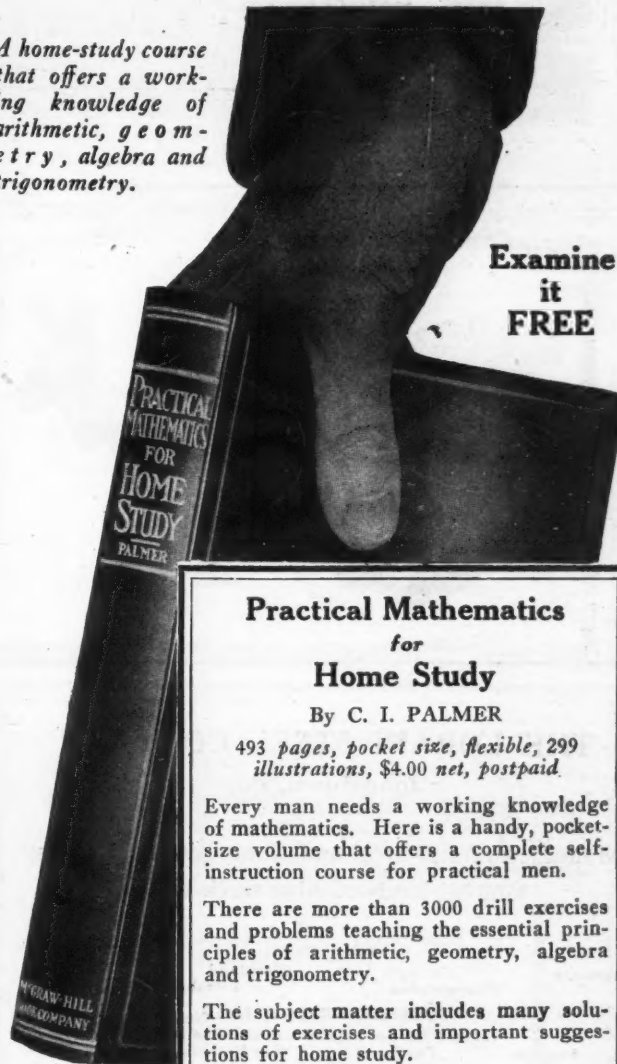
*Any type you need.
Let us know where we can reach you.*

HELMICK
FOUNDRY & MACHINE CO.
FAIRMONT, WEST VA.

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it makes mathematics
your most useful tool**

*A home-study course
that offers a work-
ing knowledge of
arithmetic, geo-
metry, algebra and
trigonometry.*

**Examine
it
FREE**



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Every man needs a working knowledge of mathematics. Here is a handy, pocket-size volume that offers a complete self-instruction course for practical men.

There are more than 3000 drill exercises and problems teaching the essential principles of arithmetic, geometry, algebra and trigonometry.

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You may send me on 10 days' approval: Palmer's Practical Mathematics for Home Study, \$4.00 net, postpaid. I agree to remit for the book or return it postpaid within 10 days of receipt.

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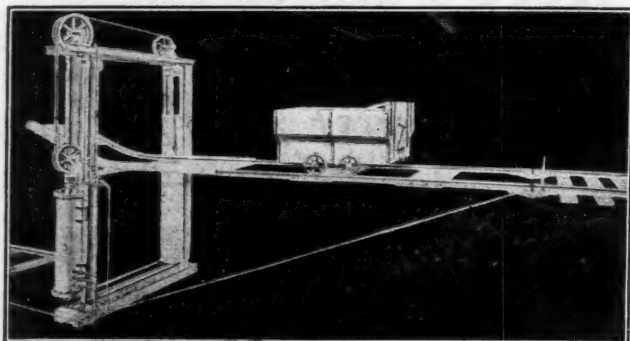
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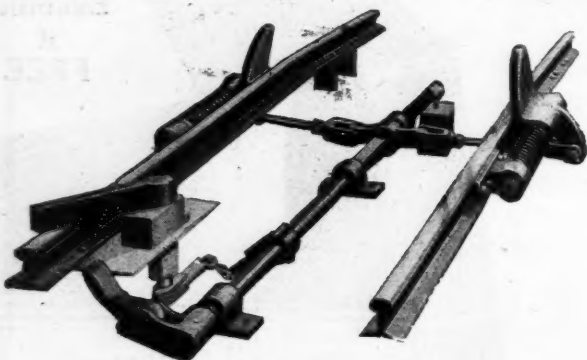


We can "lift" your expenses from the bottom with a

Holmes Automatic Empty Car Lift

(Ask us to tell you more about it)

Robt. Holmes & Bros., Inc.
Danville, Ill.



REDUCE YOUR OPERATING EXPENSES BY INSTALLING THE Nolan Automatic Systems

At the bottom, on the cages, at tipples, and at the head of inclines.

See one work and you will wonder at its simplicity and efficiency.

This is the machine you have sought; can afford and infallibly rely upon for service.

Every machine guaranteed to operate successfully.

Write us

The Mining Safety Device Company,
Bowerston, Ohio, U. S. A.

THE LORAIN STEEL COMPANY Johnstown, Pa.

Manufacturers of Steel and Composite mine cars,
and all kinds of mine track work.

Sales Offices:

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Pacific Coast Representative:

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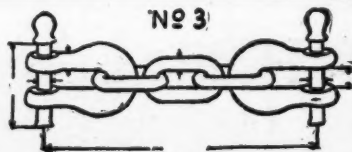
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PROMPT SHIPMENTS

We are prepared to furnish
Hitchings, any size, style or
quantity. Puncher Picks,
Machine Bits and Bit Steel.

Let us quote you.

Pittsburgh Knife and Forge Co. Established 1876 Pittsburgh, Pa.
Successors Pittsburgh Steel Mfg. Co. and Wm. Harris & Son Co.



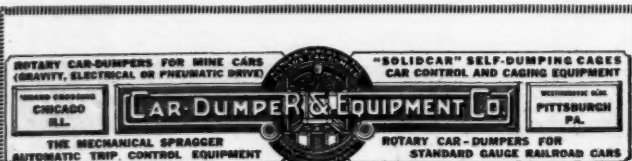
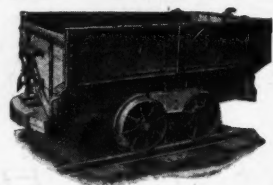
Quick Shipments

In stock for immediate shipment:
A number of mine cars, 36 and 42-
in. gauge.

We also have at all times a large
tonnage of new and relaying rails
in all sections.

M. K. FRANK

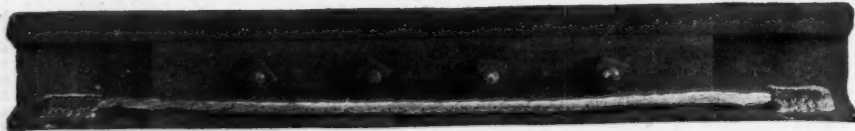
Manufacturers
Union Trust Bldg., Pittsburgh, Pa.



"See Information in Keystone Mining Catalog"

**Only Reliable Products Can
be Continuously Advertised!**

ERICO ARC WELD RAIL BONDS



Keep your voltage up
and your power bill down

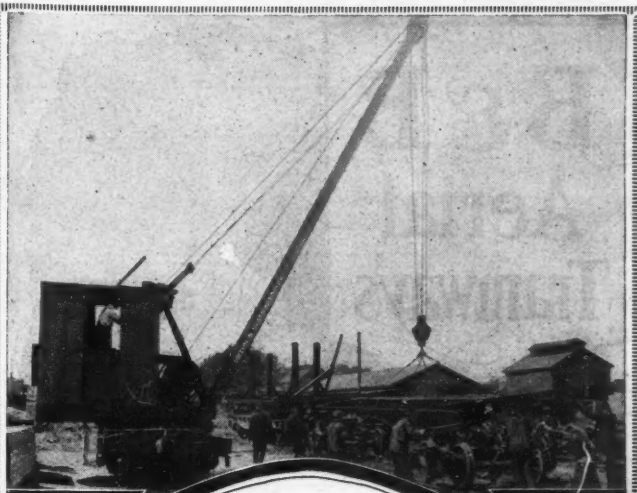
The Electric Railway Improvement Co.
Cleveland, Ohio

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LOBDELL CAR WHEELS

*Have been carrying
their share of the load
safely and economically
for eighty-five years.
Send us your
specifications for prices.*

LOBDELL CAR WHEEL COMPANY
WILMINGTON, DELAWARE, U. S. A.
Established 1836



ORTON AND STEINBRENNER
standardize on

WILLIAMSPORT
Patented
WIRE ROPE
"Telfax" Marked

It is the only Wire Rope made, the grade of which you are able to positively identify—a protection that may save lives for you if you'll adopt Williamsport Wire Rope as your standard.

Send for our booklet MWR which tells an interesting illustrated story about the "Telfax" Marker.

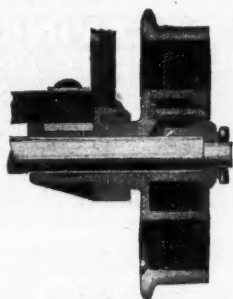
WILLIAMSPORT WIRE ROPE CO.

Main Office and Works:
Williamsport, Penna.

General Sales Office:
Peoples Gas Bldg., Chicago

Holds Lubricant for long periods—

Is seldom shopped on account of truck trouble.
Is easily applied with a few large bolts.
Is guaranteed for a year against hub wear.
Has full-floating axles with visible linch pins.



PHILLIPS

Patent Open Cap Wheel Truck

This Truck is the ideal running-gear for large or small mines, light or heavy cars, animal or mechanical haulage. It will solve that problem of hard-running cars—on level track it runs 25 per cent easier than other improved trucks selling at the same price.

Write us today

Phillips Mine and Mill Supply Co.
So. 23rd and Jane Sts., Pittsburgh, Pa

OHIO MINE CAR GREASE

Made in several grades to suit all types of wheels, whether plain, roller or ball bearing.

Its lubricating and lasting qualities are unexcelled—it, therefore, saves money, prevents hot boxes, reduces repairs, saves time and labor, permits heavier loading and speeds up production, thus increasing the efficiency of your whole mine.

Trial order sent FREE on request.

The Ohio Grease Company
Loudonville, Ohio





A Common Sense Haulage System

B & B Aerial Tramways take a bee-line from mine to tippie and dump your coal automatically. Keep your output moving, regardless of rain, sleet, snow or mud.

Save wages. Seldom require more than one or two attendants.

Operate by gravity in typical hilly coal country. When fall is insufficient, steam, gasoline or electricity may be used.

Friction Grip or Two-Bucket Types designed for your exact requirements. Built to last. Capacity guaranteed.

Full details in our interesting Aerial Tramway Book No. 9. Write for it.

BRODERICK & BASCOM ROPE CO.

New York

ST. LOUIS

Seattle

Manufacturers of famous Yellow Strand Power-steel and all standard grades of wire rope.



B316

STEEL

'CARNEGIE'

When you think of Steel—think of Carnegie

The
West Virginia Rail Co.
Manufacturers
**Light Steel Rails
and Accessories**
12-16-20-25-30-35-40-45-lbs. per yd.
Huntington, W. Va.

ANACONDA

TROLLEY WIRE

ANACONDA COPPER MINING COMPANY
Conway Building, Chicago, Ill.

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Conn.

"Super Service"

CORDS and CABLES for MINES
ROME WIRE CO.

Rome, N. Y. Buffalo, N. Y.

LIGHT STEEL RAILS

8, 12, 16, 20, 25, 30, 35, 40 lb. per yard
Splices, Spikes, Frogs and Switches

UNITED STATES RAIL CO.
CUMBERLAND, MARYLAND

NEW AND RELAYING RAILS

TRACK EQUIPMENT. GUARANTEED

L.B. FOSTER CO.
PITTSBURGH, PENNSYLVANIA

New York - Jersey City - Philadelphia - Hamilton, O.

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To secure first-class typographical set up and enable us to submit proof in sufficient time to make any necessary correction before going to press, it is essential, that we get copy in our hands together with all necessary cuts at least three weeks prior to date of publication.

Coal Age

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FROGS-CROSSINGS-SWITCH STANDS-SWITCHES-ROOM TURNOUTS-ETC.

The detailed refinements of "Cincinnati" Equipment distinguish it from the ordinary



Lugs used on all our standard switches are of heavy die-formed steel

Go over "Cincinnati" Track Equipment piece by piece and examine it thoroughly. If you will do this you will find many refinements which, though seemingly trivial in themselves, are important to you. They mark the difference between "Cincinnati" equipment and ordinary track equipment. Take for example the steel lug here shown. These are used on all standard "Cincinnati" switches.

The "Cincinnati" Frog & Switch Co.
Cincinnati, O.

Representatives

NEW YORK: The Herbert Crapster Co., Inc., 1 Madison Ave.
CHARLESTON: Mr. F. Keith Holmsted.
CHICAGO: S. W. Lindheimer, First National Bank Bldg.
PITTSBURGH: T. H. Edelblute Co., Wabash Bldg.

"CINCINNATI"

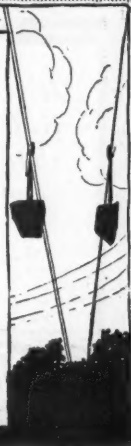
ECONOMICAL transportation of coal and mine waste is accomplished with a **Leschen Aerial Tramway**

The performance of numerous installations prove their practical efficiency.

Established 1857

A. Leschen & Sons Rope Co.
St. Louis, Mo.

New York Chicago Denver San Francisco



Blue Center Steel
WIRE ROPE

Made with a Blue Hemp Center

Our Blue Center Steel Wire Rope is made for Extraordinarily Severe Service

John A. Roebling's Sons Co.
Trenton, N. J.

OKOCORD

is tough, unkinkable and practically indestructible

It can be dragged through rough, wet or oily places and subjected to severest usage without deterioration. Made in three styles—Portable Lamp Cord; Mining Machine Cable, and Reel or Locomotive Cable.

We will gladly send a representative to discuss your wiring problems.

THE OKONITE CO.

Incorporated 1884

General Offices: **PASSAIC, N. J.**
New York Sales Offices: Atlanta San Francisco



Agents:
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gell-Andrews Co., Boston. F. D.
Lawrence Electric Co., Cincinnati.
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SIMPLEX
WIRES AND CABLES
INSULATED WITH RUBBER, PAPER OR CAMBRIC

SIMPLEX WIRE & CABLE CO

MANUFACTURERS

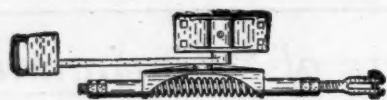
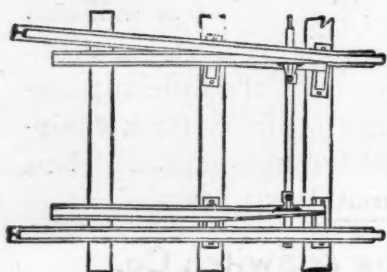
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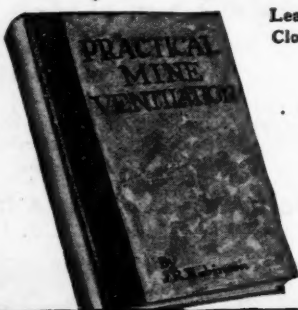
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Marion Steam Shovel Co.
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Weir Frog Co.
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Deister Machine Co.
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Okonite Co., The
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Rome Wire Co.
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Cint'l. Frog & Switch Co.
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Flood City Mfg. Co.
- Trolley Wheel Bushings**
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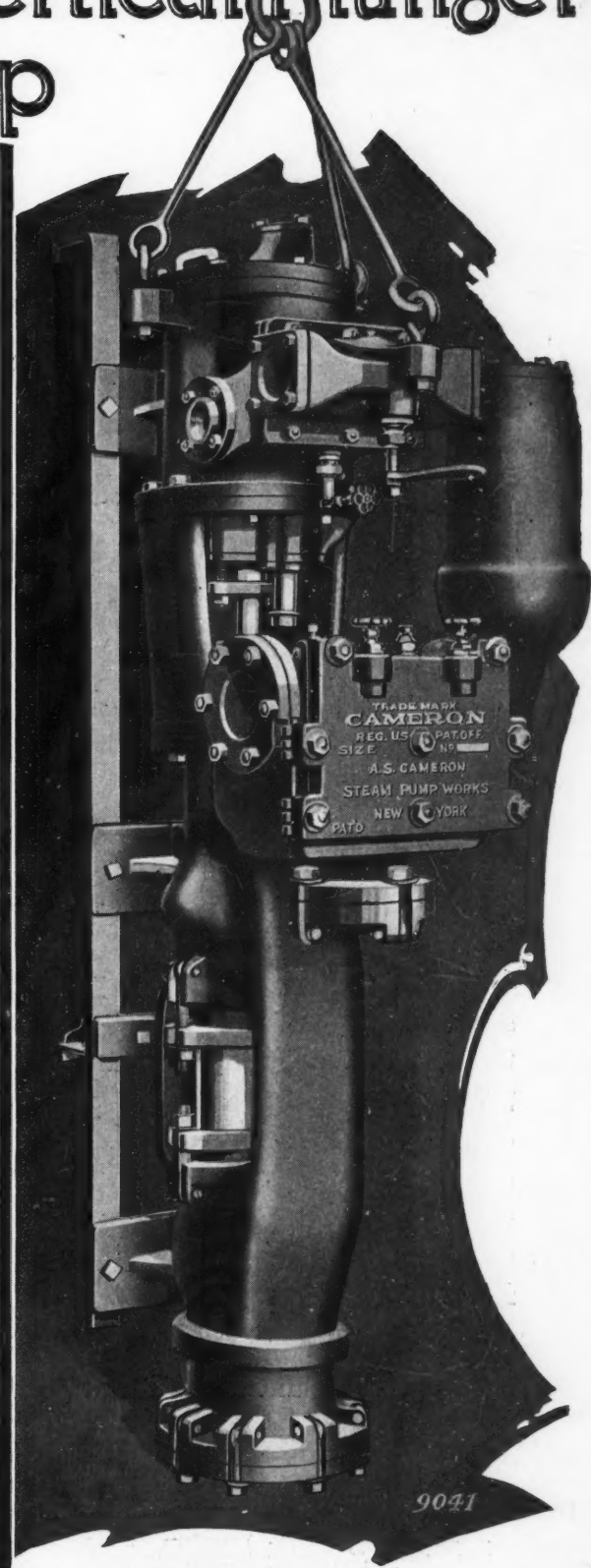
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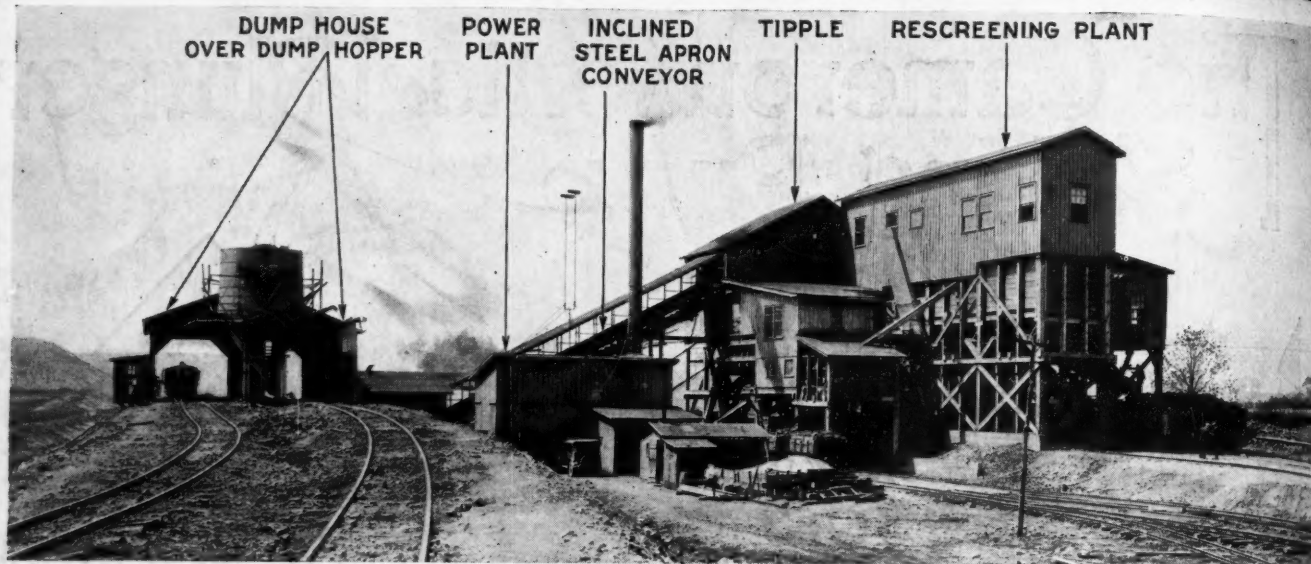
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General view of operation showing tippie, power house and rescreening plant.

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The plant is capable of running through four thousand tons of coal in an eight-hour day, and the storage tracks above the tippie have a capacity of 100 cars so that there will always be room for excess cars.

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Interior view showing picking tables.



Interior view of shaker screens in rescreening plant.

1278

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